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Community Environmental Management in New Zealand: Exploring the Realities in the Metaphor

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ABSTRACT

Over the preceding decade, there has been a national and international resurgence in the support for, and use of, community-based approaches to address the sustainable management of natural resources and systems. Despite this attention, there has been a paucity of research devoted to the critical exploration of this management method within New Zealand.

This investigation helps address this shortfall through the critical interpretative study of six community-based groups, operating in different parts of New Zealand's South Island. Those initiatives studied represented a cross section of groups from the productive (e.g., farming) and social (e.g., recreational) sectors. Each initiative was inspected through the analytical lenses of social capital, the social construction of nature and sustainability.

The study found that community environmental management (the term used to describe the approach in this thesis) is invariably more complex than prevailing images portray it. More specifically, some of the key findings from this research are: (a) the positive and negative contributions that elements of social capital can make to collective action within community environmental management groups; (b) the dualist tendency of community-based groups to provide, on the one hand, vehicles for the assertion of peoples' 'social natures', while on the other serving as arenas where these 'natures' compete for legitimacy; and (c) the disjuncture that can arise between normative notions of sustainability and the processes and outcomes associated with community environmental management endeavours. This study also highlights the role that variables such as social meaning, network ties and scale play in the form, function and delivery of community environmental management.

The image of community environmental management that emerges from this study is one of a hybrid arrangement that reflects elements of overseas experience, different theoretical contributions and contextual variables distinct to New Zealand. Further, the contribution

that this approach makes to environmental management is revealed to be more complex than inferred through popular pronouncements.

The discussion and conclusion sections of this thesis draw attention to the contribution that this study makes to the theory and practical applications of community environmental management. It concludes with a series of recommendations for improving the practice and study of this institutional form.

Key words: community environmental management (CEM), New Zealand, social capital, the social construction of nature, sustainability, qualitative, interpretative, case study.

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Finally, it is my belief that any human undertaking – this thesis included – invariably leaves an imprint on the Earth. This includes the resources used and the waste created on the path to completion. This raises a challenge for me and others who come to read this study and apply its ideas. This challenge, I contend, is to draw on the ideas contained herein to help promote the endurance and resilience of the Earth as return on the investment made by it into this document. To me, this challenge is the greatest acknowledgement of all.

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GLOSSARY OF ACRONYMS AND MAORI TERMS

Acronyms used in thesis

bTB	- Bovine tuberculosis
CEM	- Community environmental management
ECan	- Environment Canterbury
EPA	- United States Environment Protection Agency
NGO	- Non-government organisation
PCE	- Parliamentary Commissioner for the Environment
WCED	- World Commission on Environment and Development

Maori terms used in thesis (Note: All translations from Williams, 1971)

Hapu	- Sub-tribe, family
Iwi	- Tribe, people
Mahinga kai	- Food and places for gathering food and materials
Rakiura Maori	- Ngai Tahu runanga of the lower South Island
Runanga	- Assembly, council
Titi	- Mutton birds

Chapter One: Introduction

For all the emphasis given to community-based approaches within recent environment and development policy debates, results in practice have often been disappointing both from the perspective of implementing agencies, and of certain sections of the 'communities' concerned (Leach et al., 1997b, p. 4).

1.1 Preamble and Context

This study critically explores the contribution of community-based approaches to the management of natural resources in New Zealand. Like other methods of environmental management, this approach revolves around sets of actors behaving collectively to address resource issues. However, in contrast to traditional western forms of environmental administration (most often premised on the enforcement of regulations), community-based methods are distinguished through the opportunities they afford for local peoples to participate in environmental management. The on-going evolution and application of these methods has spawned a rich and diverse nomenclature centred on the community motif. This includes the notions of community-based environmental management (Hughey et al., 2002), community natural resource management (Kellert et al., 2000), community-based sustainable development (Berkes, 1989) and community-based conservation (Agarwal and Gibson, 1999). In this study, I have resorted to the relatively simple term of 'community environmental management' (CEM) to capture the themes invoked by the concept¹.

As an approach to resource management, CEM is characterised by a distinct set of defining features. These include: (a) citizen participation in resource management decision-making and implementation; which is, (b) facilitated through a redistribution of power and responsibility from centralist state authorities to

¹ Some other terms used to describe groups of this nature include the notion of 'resource care' and 'landcare' groups. I have chosen to invoke the use of the term 'community' in this project, however, following the recommendation of Hughey et al. (2002). These researchers argue that the notion of 'community-based' offers a useful catch-all for the idea of citizens engaging in some form of environmental management activity. However, I have dispensed with the word 'based' in my term owing to its self-evident qualities within the concept (Stephen Kellert pers. comm., May 2001).

community institutions; whereby, (c) those who participate receive benefits that are material or non-material in nature and which may be direct or spin-off consequences of their participation; and (d) an adaptation of the method to cover a range of resource situations, from coral reef management to waste administration (Cramb et al., 2000; Western and Wright, 1994; White et al., 1994).

Although this study focuses on contemporary examples of CEM, the concept itself is not new and has a rich heritage, self-evident through the persistence of numerous examples of long-established, local management arrangements in the likes of India and Japan (Bromley, 1992; Mosse, 1997). Nevertheless, over the last fifteen years there has been a resurgence of interest in the possibilities afforded by the CEM approach (Leach et al., 1997a). This revival has two inter-related roots. The first has been mounting dissatisfaction with the consequences of top-down, state-centred forms of resource management (Dewitt, 1994). The second has been the consideration of community participation as a means for delivering outcomes consistent with the themes of sustainable development (Leach et al., 1997b).

Within the New Zealand policy community, escalating pressures on the state and a neo-liberal policy environment has reinforced the appeal of CEM as a policy tool. With this impetus CEM has been promoted, for example, as a delivery method within the country's *Sustainable Land Management Strategy* (Ministry for the Environment, 1996) and in strategies addressing national biodiversity (Department of Conservation and Ministry for the Environment, 1998). Concurrently, a range of initiatives embracing the themes of CEM has emerged in New Zealand since the mid-1990s. These have included groups operating under the auspices of the New Zealand Landcare Trust (Towle, 2002), CEM programmes instigated by local government authorities (e.g., Environment Canterbury, 2003) and numerous examples of self-organised citizen groups (e.g., Legat, 1998). There has also been the emergence of co-management arrangements that have evolved from the redefinition of the relationship between the state and indigenous Maori (Moller et al., 2000).

Until the mid-1990s, in tandem with the above developments, the prevailing discourse on CEM was characterised by wholesale faith in its capacity to deliver

desirable environmental outcomes (e.g., Bernard and Young, 1997). Into the twenty-first century, this optimism has become increasingly questioned as the outcomes from numerous community-based programmes have failed to match aspirations and pronouncements (Kellert et al., 2000). Yet for all the space given to criticism in overseas journals and reports, non-critical images of CEM pervade in the New Zealand policy environment. Perpetuating this has been an absence, with some noteworthy exceptions (e.g., Hughey et al., 2002; Ritchie, 1998), of critical studies that have dissected the effectiveness of CEM, and in particular its capacity to deliver on pre-described biophysical goals. It is also apparent that CEM has evolved within New Zealand predominately as a practical response to environmental issues, rather than as a rejoinder to developments within theoretical fields. One consequence of this has been the tendency for researchers to concentrate on the investigation of procedural issues, such as methods for improving knowledge transfer and awareness (e.g., Allen et al., 2001), rather than on theoretically grounded evaluative studies. This has spawned a non-critical approach to CEM that has been compounded by the tendency of local government and the public media to ‘celebrate’ the outputs of CEM (e.g., levels of participation) rather than to evaluate the outcomes from this approach (e.g., improvements in water quality). I term this the ‘celebrate not evaluate’ dilemma of CEM (e.g., see Figure 1.1).

Figure 1.1: The popular image of community environmental management portrayed in a regional council publication (Source: Environment Canterbury, 2002. p. 5).

1.2 Thesis Problem and Questions

If scholars decide to refrain from critical engagement, they are party to a political economy of ignorance and complacency, questions unasked, issues not raised, data not collected and processes ignored (Li, 2002, p. 279).

The issues raised in the previous section provide both a context and impetus for this study. On the one hand, CEM is being promoted and used as a method to address numerous environmental management issues in New Zealand. On the other, there is uncertainty and ambiguity over its effectiveness in this role. Underscoring this situation is mounting international recognition that many implementation models for CEM are naïve and simplistic (McCay, 2001). A theme that emerges from this discussion is that CEM, in many circumstances, retains the qualities of a 'policy metaphor'. The attributes of policy metaphors have been described by Ostrom (1990, p. 22-23) who states that:

Many policy prescriptions are themselves no more than metaphors. Both the centralisers and the privatisers frequently advocate oversimplified, idealised institutions - paradoxically, almost 'institution free' institutions . . . [R]elying on metaphors as the foundation for policy advice can lead to results substantially different from those presumed to be likely.

An inference to be drawn from the above statement is that policy metaphors generate uncertainty for institutional processes, which in turn can affect their accomplishments (Ostrom, 1990). The problems these tendencies can give rise to for CEM have been described by numerous scholars (e.g., Brosius et al., 1998; Kellert et al., 2000; Leach et al., 1997a). A review of this literature suggests that metaphoric qualities within CEM approaches are disadvantageous for several interrelated reasons. These include: (a) general and standard images of CEM do not cater for the intricacies and variations of individual field settings where the approach is applied; this in turn, (b) tends to increase the capacity for differences to arise between the expectations of administrators and what occurs in the field; leading on to this, (c) failure to recognise and accommodate the intricacies of local settings may lead to CEM programmes perpetuating the issues they were designed to address and the inefficient use of resources. Overall, from an efficacy perspective, none of the above outcomes appears desirable and all have the potential to cause policy failure (Sabatier, 1991; Songorwa, 2000). Consequently, the above discussion suggests two

central research questions that should underscore the critical analysis of CEM. These are:

- what does the approach of CEM entail as far as a method of environmental management is concerned?; and
- how effective and efficient is CEM as an environmental management tool?

These questions formed the focus of this inquiry and are reflected in the goal and objectives of this study.

1.3 Goal and Objectives

The goal of this study was to use a qualitative research approach to explore the processes and outcomes associated with six individual CEM group initiatives operating in the South Island of New Zealand. Through this endeavour, it was anticipated that a series of insights would emerge of *theoretical* and *operational* relevance to CEM initiatives functioning elsewhere in New Zealand and overseas. Nevertheless, because of the limited number of case studies used in this research, it was necessary to consider what is presented here as a study 'of', rather than 'the' study, of CEM in New Zealand. To direct this inquiry, three theoretical lenses were used to 'ground' this study² (Glaser and Strauss, 1967). These lenses are based on the following theoretical areas: (a) social capital; (b) the social construction of nature; and (c) sustainability. Using these lenses, it was anticipated that the resulting insights would contribute to a more in-depth understanding of CEM, which could assist in moving it beyond the narrow confines of its contemporary images within New Zealand.

While the above description captures the goal of this study, efforts to meet it were organised around the achievement of the three following objectives:

- (a) a critical assessment of the form and function of CEM in the New Zealand context, and its contribution to environmental management;*
- (b) the exploration of the performance of six CEM initiatives using interpretative methods; and*

² The notion of 'lenses' as an analytical device is taken from Allison (1971).

(c) to provide a series of theoretical and practical insights that contributes to the development of CEM as a policy device.

1.4 Thesis Overview

The rest of the thesis is divided into the following chapter format. Chapter Two provides a critical review of the theoretical themes and functional forms embraced within contemporary expressions of CEM. Chapter Three describes the methodology adopted in this research, including the approach, methods and theoretical foundations on which this study was based. Chapter Four introduces the context for this inquiry, including a background to environmental governance and CEM in New Zealand, and a description of the case studies on which this research was centred. Chapters Five, Six and Seven comprise the analytical portions of this study; with each chapter centred on one of the lenses previously described in Section 1.3. Chapter Eight presents a discussion of the findings from the preceding analytical chapters and raises implications for the theory, practice and study of CEM in New Zealand and overseas, and recommendations for its theoretical and practical development. Chapter Nine, finally, provides a conclusion to the overall study.

1.5 Confessions of a Researcher

One of the parameters for promoting validity within qualitative research is the act of reflexivity (Tolich and Davidson, 1999). Reflexivity can be thought of as both an outlook and a process whereby the researcher considers how their values, meanings and beliefs influence the observations and conclusions they draw while undertaking research (Lofland and Lofland, 1995). One means of promoting reflexivity, which is common within qualitative studies, is for the researcher to be 'up front' about the experiences and outlooks they bring to their research topic. To this end, what follows is a confession of background aspects of myself that intersect with this thesis.

I come to this study of CEM as a person who has a deep interest in the physical environment and the way people interact with it. This interest has been reflected in my travel, career, academic and recreational choices. Noteworthy here has been my work with the North Canterbury Fish and Game Council, since 1994.

This has not only brought me into contact with numerous CEM groups, but also with some of the issues that arise from attempts to use the CEM approach to address biophysical problems, particularly cases of waterway degradation. A case-in-point in this regard has been my professional work with CEM groups operating in the Barrys Stream and Waitutu catchments, both of which are included as case studies in this research.

As an individual concerned with environmental matters, the subject of CEM offers an interesting topic for research. On the one hand, CEM is 'out there' being promoted as a viable method for achieving sustainable resource outcomes (e.g., Bernard and Young, 1997; Pye-Smith et al., 1994). On the other, there are questions about its efficacy in this role. In my position as a researcher, meanwhile, I consider myself relatively impartial about the merits or otherwise of the approach. What I do bring to this study is a desire to understand better the opportunities and limitations CEM faces as a means for managing natural resources in New Zealand. To this end, this study provides an opportunity to undertake an analytical treatment of the approach, thereby contributing to its evolution as a form of environmental policy. The next chapter provides the foundations for this task by setting out the theoretical and functional ideas underpinning modern-day expressions of CEM.

Chapter Two: Community Environmental Management: A Critical Review

The special place of 'community' in resource management and rural development is the outcome of a loosely woven transnational movement unified by goals such as social justice, environmental health, and sustainability (McCay, 2001, p. 183).

2.1 Introduction

To gain an appreciation of the issues at the centre of this study, it is necessary to have a critical appreciation of the CEM approach. This chapter serves this objective by setting out a critical review of the origins, theory and experience of CEM, drawn from observations within New Zealand and overseas. Underpinning this review is the argument that contemporary expressions of CEM are based on a range of contrasting narrative expressions, each with its own theoretical focus and image of what CEM entails. Each of these narratives represents a different 'reality' for CEM, the understanding of which are necessary if one is to proceed with an analysis of the approach. Before proceeding into this review however, it is relevant to background CEM's origins within the wider context of environmental management.

2.2 Contemporary Origins

As an institutional approach, CEM has emerged from wider attempts to manage the human exploitation of natural resources (Kraft and Johnson, 1999). Historically, western-oriented practitioners have situated these efforts within what Dewitt (1994, p. 5) labels the "command and control" paradigm. A feature of the modernist corporate state, the paradigm promotes management methods grounded in central institutions and 'top-down' systems of policy governance (Bührs, 2000). Other qualities of the paradigm include a reductionist and incremental approach to problem solving and an image of the public as a passive, decision responding body (Dryzek, 1992). Traditionally, these qualities have been expressed in resource management by an emphasis on the enforcement of regulations (Kraft and Johnson, 1999). Supporting this approach has been an administrative mindset underpinned by

a faith in centralist and instrumental systems of governance and rational science (Torgerson, 1990).

Through the latter half of the twentieth century, command and control approaches to resource management have come under mounting scrutiny as an array of problems have failed to yield to their methods (Dewitt, 1994). A case-in-point has been the inability of authorities to develop effective regulatory tools to address the issue of rural non-point pollution (Furusetth and Cocklin, 1995). Concurrently, in countries such as Tanzania and Botswana, development programmes centred on western command and control style mechanisms have frequently failed to promote the themes of sustainable development, with adverse consequences for local peoples, wildlife and habitats (Twyman, 2000). These difficulties have prompted a search for policy alternatives to replace or supplement those of the paradigm (Dewitt, 1994). Reinforcing this has been structural adjustment tendencies centred on neo-liberal economic ideals that, in countries such as New Zealand, have instigated the withdrawal of the state from local and regional management and service provision (Easton, 1999). In this 'policy environment' alternative management approaches that have been considered include: (a) education (Stokking, 1999); (b) market-based instruments (Jacobs, 1991); and (c) civic-based initiatives, including individual participation and community governance (Asher, 1995). Initiatives of this latter form – community governance – are the focus of this study. An exploration of the narratives within this policy field now follows.

2.3 Community Environmental Management Narratives: Theory, Images and Criticism

On review, what is meant by CEM appears to be underpinned by contrasting images of what is embraced by the concept. Nevertheless, at a general level these images do share an appreciation of CEM as an approach that can: (a) build social capital; (b) reduce stakeholder conflict; (c) permit the sustainable management of biophysical, social and economic issues; and (d) produce better policy outcomes (Conley and Moote, 2003). Beyond these themes, each image is grounded on different theoretical approaches, which in turn express contrasting interpretations of what makes CEM effective and efficient. For analytical purposes, it is useful to sort

these descriptions into a series of categories and to define the theoretical themes and functional forms that they respectively ascribe to CEM. This is the focus of this section, with a summary of its observations set out in Table 2.1.

2.3.1 The 'participatory' narrative

The first narrative is rooted in contemporary expressions about the roles that public and community participation can play in policy development and implementation (e.g., Domeck et al., 1997). Underscoring these expressions is the arguments that through improved levels of 'grass-roots' participation it should be possible to: (a) identify public issues more readily; (b) achieve access to human and social capital; (c) improve levels of equity; and with these (d) improve the capacity for sustainable environmental outcomes (Mitchell, 1997). Underpinning these arguments has been support for participatory methods within the dialogue on sustainable development (e.g., World Commission on Environment and Development [WCED], 1987) and new theories of democracy³, based on deliberative and communicative decision-making and planning (Dryzek, 1990; Hayward, 1995).

Focusing on the themes from sustainability, the apparent limits in the ability of command and control methods to promote its goals, has encouraged the exploration of what more 'open' methods of governance can provide (Gadgil and Berkes, 1991; Tester, 1992). In this light, attention has turned to ways of drawing local communities into environmental management, initially in the 1970s and 1980s through field techniques (e.g., Rapid Rural Appraisal) and since the mid-1990s, through *collaborative* arrangements (see Mitchell, 1997). Underpinning the themes of collaboration, meanwhile, has been the normative assumption that through authorities and local people co-operating, it should become possible to transcend many of the problems that adhere to the command and control paradigm of environmental governance (Paehlke and Torgerson, 1990). This includes, for example, strategies of management that do not reflect local concerns, values and meanings (Preister and Kent, 1997).

³ These include theories of participatory and ecological democracy (see Hayward, 1995).

Table 2.1: Prominent narrative 'realities' of community environmental management

Narrative	Origins	Theoretical Images of CEM	Critique Examples
<ul style="list-style-type: none"> • Sustainable development theory • New democratic theories • Field experiences (e.g., developing countries) 	<p>Collaborative arrangements between state authorities and community-based groups involving sharing of power, responsibility and resources (e.g., Bernard and Young, 1997)</p>	<ul style="list-style-type: none"> • Questions about form, scale and equity of participation • Opportunity and transaction costs of participation treated as non-problematic (e.g., Brasell-Jones, 1998)
<ul style="list-style-type: none"> • Political economic theories of communal property rights and collective action • Field experiences of long-run communal arrangements 	<p>A set of binding institutional rules, sanctions and customs, situated within a defined locality, which control management and access to common pool resources (e.g., Ostrom, 1990)</p>	<ul style="list-style-type: none"> • Idealised version of world that overlooks complexity of contemporary life • Economically deterministic in treatment of human actor and action • No inclusive theory (e.g., Mosse, 1997)
<ul style="list-style-type: none"> • New social movement theory • Social justice literature • Political ecology studies 	<p>Voluntary, self-organised groups, premised on shared meanings and values of participants (e.g., Pye-Smith et al., 1994)</p>	<ul style="list-style-type: none"> • Simply another definition of interest groups • Essentially a middle class political device • Agencies for resistance but not assertion (e.g., Buttel and Taylor, 1994)
<ul style="list-style-type: none"> • Communitarianism • Community development theory 	<p>Community is a social unit that can be drawn on to manage for prescribed environmental goals (e.g., Tewari and Isemonger, 1998)</p>	<ul style="list-style-type: none"> • Idealised or undefined image of community • Ignores complexities that reside within communities • Lack of emphasis on biophysical accomplishments within critical studies (e.g., Mills, 1994)

There are various overseas and New Zealand initiatives that reflect the participatory themes described above. A case-in-point has been community-based wildlife programmes in Africa, which have focused on using local people to assist in the management of animals and habitat. These have included drawing villages around the Selous Game Reserve (Tanzania) into operations to control poaching, and integrating local populations into the management of the endangered colobus monkey in the Jozani area of Zanzibar Island (Tanzania) (Fitzpatrick and Else, 1999; Songorwa, 2000). In New Zealand, efforts at encouraging citizen participation were behind attempts, in the mid-1990s, to develop an integrated management plan for the Whaingaroa Harbour (North Island), and more recently, an on-going initiative for collaborative management of the Avon-Heathcote Estuary (South Island) (e.g., Kilvington, 1998).

Critics of the participatory narrative have focused on questions about the level and forms that public participation takes within CEM. At the centre of this have been questions about the degrees to which power and responsibility are given over to local actors, and how representative such peoples are of the wider public. McCloskey (1998) and Coggins (1998), for example, have questioned the degree to which public interests are adequately considered within participatory processes. Elsewhere, in the United States environmental advocates have condemned a number of collaborative arrangements because of their capacity to cede public interests to local groups (Coughlin et al., 1999). Also missing from the participatory narratives is frequently an appreciation of the opportunity and transaction costs that participation incurs for individuals (e.g., Society for Applied Anthropology, 2001); often for example, in my experience, agency staff attend collaborative forums as paid representatives, a status that does not extend to public attendees. In this regard, it can be argued that public participants' time is treated as a free good, an assumption that should be questioned because of the transaction and opportunity costs that participation incurs for an actor (see Falconer, 2000). Concerns about this situation were raised in the 2001 report of the *Community and Voluntary Sector Working Party*⁴, which identified the constraining role that voluntary work was placing on

⁴ The report evolved from a Labour Party initiative to investigate the community/government relationship in New Zealand from its 1998 election manifesto.

sections of the country's community. Further, as overseas studies have demonstrated, such costs are not always borne equally. Work by Li (1996), for example, has identified how efforts to promote CEM in the management of forest remnants in India resulted in local female populations inheriting a disproportionate amount of the project's tasks. The consequence of this included negative impacts on the lifestyle of local women and the efficacy of the programme itself.

2.3.2 The 'common property institutions' narrative

Arguably, the most theoretically detailed CEM narrative has evolved from an interest in the communal management of common pool resources⁵ (Agrawal, 2001). Behind this interest has been the persistence of numerous long-lived, community management arrangements, the examples of which have inspired theorists to explore the possibilities of replicating these institutions elsewhere (e.g., Blomquist, 1992; Ostrom 1999; 1998). Two prominent expressions of CEM presented through this narrative are: (a) co-management; and (b) communal arrangements grounded in the themes of the *institutional design and development framework*.

Exploring the former firstly, a number of the scholars who have described the co-management approach have typically focused on the capacity for transforming traditional rules, customs and sanctions into management regimes to resolve contemporary common pool resource dilemmas (e.g., McCay and Acheson, 1987). Pinkerton (1994), for example, has explored the role that co-management approaches, based on the codification of traditional practices, could play in the management of the British Columbian salmon fishery. A New Zealand example of co-management, meanwhile, has involved the Crown ceding back to Rakiura Maori the rights to harvest mutton-birds on the Titi Islands of Foveau Strait (Moller et al., 2000). In this case, attached to this re-investment of rights has been the expectation that Maori would invoke traditional rules and codes to ensure the sustainable harvest of these birds.

⁵ Pinkerton (1994) notes that the term 'common pool resources' embraces resources that are open to a wide number of potential users. These can include, for example, marine fisheries and the assimilative capacity of large water bodies.

In the other expression, the development of the institutional analysis and development framework has been led by the work of Ostrom (1990). Drawing on numerous case studies, this scholar and others have sought to identify variables that can overcome the dilemmas that arise in different common pool resource situations (e.g., see Mäkelä, 1999). Central to the identification of these has been the detailed study of numerous common property arrangements in different parts of the world, including initiatives for managing groundwater in California and irrigation networks in India (e.g., Tang, 1992). From these case examples, sets of pre-conditions and design principles have been devised that are argued by different scholars to hold the basis for effective communal property management of common pool resources (e.g., Baland and Platteau, 1996; Wade, 1988).

What these approaches share have been a focus on how to organise and manage human collective behaviour towards common pool resources in ways that ensure their integrity as resource systems, using community property rights systems. In this context, CEM emerges as an institutional arrangement centred on collective property rights, which circumvent the individual impulses synonymous with the so-called 'tragedy of the commons' (Hardin, 1968). Several aspects of the common property narrative, in turn, make it appealing to environmental managers (e.g., Mäkelä, 1999; World Bank, 1998). The idea of definable conditions and variables, for example, provides a clear image for practitioners of what is required to make an organisation effective. In this sense, the job for managers is clear: to provide these pre-conditions and design principles.

Invariably, the world is more complex than that construed in the idealised world of common property literature. When investigating examples of long-lived common property institutions, for example, one is struck by questions about their present-day viability in the rapidly changing social, economic, political and biophysical environments they occupy. An example is how the breakdown of social capital, along with wider social and economic changes, has affected the efficacy of coral reef common property arrangements in the Philippine and Indonesian islands (e.g., Buenavista, 1999). Formal critiques, meanwhile, have been critical of the emphasis the common property approach has given to economic motivations as the

basis for human behaviour. Mosse (1997), for example, has emphasised how human actions reflect a broad range of impulses that include various social considerations. At a functional level, Agrawal (2001) has questioned the approach for its failure to integrate the numerous descriptions of design variables into a concise implementation model.

2.2.3 The 'new social movements' narrative

Mounting problems of economic and ecological security, and issues of identity and social justice, have contributed to the rise, in post-1960s western society, of less institutionalised forms of social organisation (Buttel and Taylor, 1994; Cohen, 1985; Lash and Urry, 1994). Described as new social movements, these organisations have occupied the space of non-institutionalised politics, with their members seeking to invoke political change and novel forms of governance (Offe, 1985; Scott, 1990). Urry (1995, p. 215) has summarised the features of these sociations to include: (a) voluntary membership (with freedom of departure); (b) a self-organised and an unbureaucratic structure; (c) mutuality based on 'norms of reciprocity'; and (d) membership reinforcement grounded in emotional satisfaction rather than goal attainment. For Martin and Halpin (1998), meanwhile, the political quality of these sociations resides in their efforts to have their actions recognised as legitimate and accepted as universally binding for wider society⁶. This movement has extended to an interest in new, looser social arrangements for the management of natural resources (Martin and Halpin, 1998).

The idea of CEM groups as instances of new social movements has been explored by numerous scholars (e.g., Martin and Halpin, 1998; Pye-Smith et al., 1994). An exploration of these accounts yields a number of descriptions that echo the new social movement themes described above. A case-in-point has been the portrayal of various coast care groups, operating around New Zealand, provided by Legat (1998). The new social movement aspects of these groups include voluntary membership, unbureaucratic structures and an identity focus based, for instance, on

⁶ New social movements differ from 'interest groups' in several ways. Values and meanings, for example, are central to the former but not to the latter. Interest groups, meanwhile, are considered to operate in the institutional realm of politics and to be more formal and hierarchical in structure than new social movements (Martin and Halpin, 1998).

shared ideas of clean and healthy water (Legat, 1998). In the overseas literature, CEM and the new social movement narrative are often fused together in the example of organisations formed to champion the concerns of disadvantaged groups, including those discriminated against on the basis of race and gender (Bernard and Young, 1997). In descriptions of these organisations, the emphasis is usually on how they can facilitate the representation of various members' values and meanings in different resource management arenas (Miller et al., 1996). An example of a group imbued with these themes includes the WATCHDOG organisation formed to contest the racial and political inequities underscoring air pollution in Los Angeles (United States) (Pye-Smith et al., 1994).

Critiques of the new social movement narrative have tended to be general in character, rather than focusing specifically on its CEM forms. Abercrombie et al. (1994) suggests that the distinctiveness of new social movements may be exaggerated and that they are simply a variant form of the older notion of interest groups. This argument is based on the observation that so-called new social movements often replicate interest groups through their recourse to traditional political processes. Others have suggested that new social movements are the preserves of the middle class and represent a further attempt to politically marginalise lower class groups in their struggles (Buttel and Taylor, 1994). Habermas (1981) has questioned the extent to which new social movements can effect political change at all, his contention being that they are only organisations of resistance rather than assertion.

On reflection, investigations suggest that new social movement-style organisations, such as coast care initiatives, have indeed entered into traditional political practices, often have significant middle class membership and sometimes defend existing values. However, to discount these as not distinct movements appears to miss the key point at the centre of this concept: this is, the idea of people operating outside the traditional institutional structures of the command and control paradigm. The question of whether these groups are about upholding or asserting certain meanings, meanwhile, appears to be a question of perspective. There is also the operational reality that theoretical concepts can morph into something that

reflects elements of other social organisations. This need not mean, however, that the former type is an irrelevance to our understanding of policy phenomena.

2.3.4 The 'community' narrative

The 'community' narrative is premised on the theme that within communities there are human, social and physical resources that can be mobilised for the purposes of environmental management (e.g., Ife, 1995; Midgley, 1986). Further, it also embraces the claim that the development of community-based initiatives can contribute to the re-vitalisation of local social and economic conditions (Kemmis, 1990). Unsurprisingly, those working within this narrative have turned their attention to ways of mobilising communities to achieve the above ends (e.g., Mills, 1994; Tewari and Isemonger, 1998). Underpinning this search has been two prominent theoretical threads; these are: (a) communitarianism; and (b) community development theory.

The origins of communitarianism can be discerned in the classical sociological work of Durkheim (1897 [1951]) and his focus on the opportunities within communities to remedy the excesses of capitalism. Contemporary scholars, such as Etzioni (1993), have also argued the case of community rejuvenation as a rejoinder to the problems of alienation and disharmony in modern western society. A linkage has additionally been made between the above themes and the evolving discourse of social capital theory (e.g., Putnam, 1995); in this dialogue it has been suggested that the presence of trust, norms and social rules within communities can assist in the recuperation of civic culture (e.g., Fukuyama, 1995; Putnam, 1995). Sharing some of the above ideas, community development theory reflects origins that are more functional in nature. For example, nineteenth and early twentieth century colonial administrators from Britain and France explored how they could use indigenous communities to achieve their imperial goals (Robinson, 1995). In the 1950s, the United Nations brought a similar interest in communities to its programmes for the economic and social development of various third world nations (Lotz, 1987). These applications have not been restricted to developing countries. Robinson (1995), for example, describes the use of community development

programmes in Canada (during the 1930s), which were developed to address issues of economic hardship and the harshness of the country's climate.

A CEM-style group in New Zealand, whose features have reflected the descriptive qualities of the community narrative, is Leithfield Community Watch (Inc.). Although a group whose physical activities have focused on managing aspects of the local environment of Leithfield - a beach settlement north of Christchurch (South Island) - the emphasis given to it in the popular literature has included its description as a means for 'improving community' (e.g., Moore, 1998). Statements, accredited to local residents, reiterate this 'community' narrative theme, emphasising the capacity of local-based initiatives to re-vitalise communities and the idea that within communities there reside resources that can facilitate the accomplishment of certain ends:

We are attempting to recover a bit of community spirit - and it proves that this is definitely a good community to live in (Ron Adcock, group member, quoted Moore, 1998, p. 13).

Between the members of the Community Watch is a wealth of experience, which is being put to worthwhile use. No job is too big or small (Mel Stewart, group member, quoted Moore, 1998, p. 13).

Although this emphasis on the opportunities that reside within communities for environmental management carries an ethical, even sentimental attraction, it has several shortcomings. A general concern is the repeated failure to define what in fact 'community' means. Implicit in much of the popular literature, for example, is recourse to the traditional notion of harmonious social relationships shared by individuals within a locality (see Thompson, 1971). Attractive as this normative image may be, this form of social organisation is seldom replicated in contemporary western societies, such as those of New Zealand. Moreover, the view of community as a unified, organic whole, fails to attend to the differences that exist in them, and ignores how these can affect resource management outcomes, local politics and social relationships (Agrawal and Gibson, 1999; Mills, 1994). There are also implicit, with the narrative, assumptions about the goals communities aspire towards, namely that these are internally consistent and in harmony with those of wider society. A case-in-point is the assumption that all people within a community see the

natural world in the same way, or that the community's interpretation of the physical world matches that of wider society.

Two applied problems emerging from images of CEM based on the themes of the community narrative have been, firstly, the observation that transferring authority to a local community may see outcomes that, while meeting the interests of a particular 'community', they do not reflect the normative expectations of wider society (Coggins, 1998). Secondly, some critics have identified a tendency for community-based narratives to prioritise social well-being over biophysical variables (Cannan, 2000). This is a recurring theme in many of the environment-centred case studies punctuating the volumes of the international journal *Community Development*. It was also a feature of the aforementioned article on the Leithfield group (Moore, 1998). As a researcher critical of this approach, Mills (1994) makes a call for increased levels of biophysical evaluation in projects grounded on the themes of the community narrative. This is something that he himself undertakes in an investigation of community-based fish farming initiatives in Malawi.

By the means of a summary observation, from the elements raised in this review, six assumptions can be discerned within the general policy discourse that describes CEM. In bullet form these assumptions are:

- local environmental users, because of their proximity and relationship with local physical environments, are ideally placed to manage such systems;
- local peoples have the capacity *and* inclination to 'take on' local environmental issues;
- through CEM positive biophysical change is achievable;
- social, economic and institutional structures are neutral in terms of an influence on the above factors;
- CEM processes are non-politicalised; and
- the notion of what constitutes the 'environment' is non-contested.

Overall, this review of CEM highlights the theoretical and operational diversity that arises within the expression of community environmental management, with contemporary expressions of CEM frequently including aspects of at least two

of the narratives I have described. Because of this tendency, an attempt to use these narratives as typologies for the grouping of CEM groups is not recommended. Rather, it is more useful to consider them as useful heuristic devices for organising and understanding the mounting literature and examples of CEM groups operating within New Zealand and elsewhere.

By way of summary, efforts to describe CEM presently extend from ideals of participation and concepts of new social organisations, to origins that are grounded in the themes - as with the 'common property rights' narrative - of political economy. Practically, initiatives themselves range from top-down efforts to engage local populations in state-oriented programmes, to projects organised and implemented by local actors (Brosius et al., 1998; Pye-Smith et al., 1994). The biophysical media they cover is similarly diverse, from air and water to mountain lands and forests (Zeller, 1997; Mehta and Kellert, 1998). As this review of narratives suggests, to speak of homogenous notions of CEM therefore appears inappropriate and to complicate the process of assessment. Further, in comparing and contrasting the four different CEM narratives, several critical points and questions emerge. These provide indicators as to why this investigation is necessary and the matters that should be addressed by it. What these are and where they emerge from is the focus of the next section.

2.4 Critical Reflections

In exploring the critical issues raised in the preceding section, several points of note arise. Firstly, each narrative yields a different form and function of CEM (see Table 2.1). Most obviously, this is reflected in the notion of 'community' that emanates from each. In the 'common property institution' narrative, for example, community is expressed as people living and working within defined physical boundaries (Mäkelä, 1999). In the 'participatory' and 'community' narratives, the definition is more functional and reflects consideration of the questions of who should and wishes to be involved in a CEM initiative (e.g., Mitchell, 1997). In the 'new social movement' narrative, it is defined in terms of social meanings and values; with a 'community' being a group of people who share these and wish to work together to uphold or assert them (e.g., Scott, 1990). Beyond these some scholars working in the CEM arena, such as Western and Wright (1994), have

deliberately chosen not to define the term, leaving it to emerge from their case material instead. In a similar fashion, popular and local government documentation on CEM in New Zealand has usually not sought to define the term resorting, by *de facto*, to traditional understandings of community (e.g., Waimakariri District Council, 1998).

The recourse to non-specific or idealised notions of community has been criticised by numerous scholars because of its negative implications for CEM theory and practice (e.g., Agrawal and Gibson, 1999; Li, 1996). Research has shown, for example, how failure to understand the intricacies of communities can perpetuate social conflict, disguise and erase stakeholder voices and threaten livelihood-security and gender equity (Bailey, 1997; Li, 1996). These observations suggest that CEM is ill served by descriptions that do not provide insights into the intricacies of community form and process. Further, this situation complicates the ability to understand how variables, like social capacity, are able to function within CEM to create collective action. Such situations are vexing for resource managers and theorists alike.

Secondly, despite its centrality within the concept of CEM, the question of what is meant by 'environment' within the approach has gone largely unchallenged. What passes as 'environment', instead, has often assumed to enjoy normative agreement, both by theorists and by practitioners (e.g., Pye-Smith et al., 1994). What makes this absence especially topical has been the rise, through the 1990s, of theoretical arguments that have challenged the normative notions of nature as a singular and objective entity. This discourse has emphasised, in contrast, the social origins of nature and its subjective and hybrid character across space and time (Castree and Braun, 1998; Franklin, 2001; Irwin, 2001). It is self-evident that questions over what is 'nature' have implications for CEM, including what is taken to be the focus of management and what this should entail. Despite the centrality of these questions to CEM, the analytical work on this matter has been sparse⁷.

⁷ In contrast, studies that have explored this issue include Lobley and Porter (1998) and Paulson (1998).

Thirdly, it is apparent that each CEM narrative is underpinned by a different image of the human actor and human action. The image within the 'common property rights' narrative, for example, is of a *homo economos* actor, whose actions are premised on economic imperatives (Mosse, 1997). In the new social movement literature, the CEM actor is an interpretative being, responding to and acting on individual and group meanings. In the 'participatory' and 'community' narratives, the image of the actor and action are less precise. Both emphasise, in common, the positive aspect of having people involved in environmental management (e.g., Bernard and Young, 1997). Across all of these narratives, as for the concept of community, the appreciation of the human actor and action they provide appears simplistic. Missing from them, for example, is recognition of the roles that human agency and social structure play on how people *wish* and are *able* to act. Again, as for the previous point, this complicates the understanding of how elements like social capital are able to impact on the collective actions of people engaged in CEM endeavours.

Exploring examples of other work in this area, Davenport (1997) has described the necessity of considering the role that human agency and structure play in the behaviour of participants involved in the Australian Landcare programme⁸. Expanding on this topic, Lobley and Potter (1998) have described the role that social and political structures play on people's behaviour within voluntary programmes. The nature of their impact can be such, as Davenport's (1997) research demonstrates, that objectives of biophysical sustainability fall behind the imperatives of short-term economic survival. Drawing on ideas from ethnomethodology and social constructionism, McHenry (1994; 1998) has additionally revealed how a combination of internal (e.g., personal meanings) and external (e.g., economic factors) issues have affected the way Scottish farmers interpret conservation initiatives and organise their responses to them within community-based programmes.

⁸ The Landcare programme is a Federally funded initiative, developed in the 1990s to address issues of land degradation in Australia (Yencken and Wilkinson, 2000).

The fourth concern relates to the descriptions of power within CEM theory and applications. Within the 'participatory' and 'community' narratives, for example, the popular image of power is as something devolved by central authorities down to communities (Martin, 1997). By contrast, less attention is given to how power is *acted through* CEM in the four narratives I have described⁹. Directing attention at this question requires the focus to turn to how the processes and outputs from CEM affect the social, economic, political and physical environments that initiatives are situated within. A case-in-point has been the work of Lockie (1999), on the Australian community-based Landcare programme. Lockie argues that one should not take the normative meanings ascribed to group activities for granted. Rather, he suggests it is necessary to explore how CEM initiatives are used and presented by different sectors and actors to articulate and advance their meanings. One form this can take is through the process of co-option, whereby certain interests seek to align themselves to the themes of 'land care' through sponsorship arrangements. By doing this, the likes of pesticide companies have been able to present themselves as supportive of Landcare's themes, without needing to adjust practices that are inconsistent with the land sustainability themes mooted by the programme (Lockie, 1999).

Fifthly, as the distance between the initiation of community-based projects and the present-day has grown, more questions have been raised about the biophysical accomplishments achieved under CEM (Leach et al., 1997a). Kellert et al. (2000), for example, has noted that many of the accomplishments attributed to CEM have tended to be social and economic in nature, while positive biophysical achievements have been harder to identify. Such tendencies have subsequently made it difficult to gauge the contribution of CEM to biophysical sustainability, something that given the normative links made between CEM and this concept, is a matter for concern. A relevant New Zealand example has been Salmon's (1999a) investigation of a CEM initiative undertaken to restore the Waikakahi Stream in South Canterbury (South Island), following the adverse impacts that silt-laden run-off had on its benthic environment. Salmon (1999a) found that despite the considerable input of

⁹ In comparative terms this is something that scholars within the new social movement narrative have handled rather better than those from the other three narratives (see Martin and Halpin, 1998).

resources (including time) from group members and the local water management authority, the initiative had not rectified the physical issues at the heart of the stream's problems. In particular, he observed that inputs of silt into the catchment were still having deleterious impacts on the waterway. Salmon (1999a) attributed this effect, in part, to the hydrological character of the Waikakahi catchment and the actions of non-participating farmers.

Finally, while critical accounts of CEM in New Zealand are limited, those that have been instigated have made some insightful observations on the effectiveness of the approach. A study by Ritchie (1998), for example, identified that the extent of positive biophysical change attributable to CEM initiatives in the Waikato region (North Island) had been limited. Politically, meanwhile, Ritchie (1998) noted that different sectors had sought to co-opt groups to achieve their own political ends. A study of six South Island CEM groups undertaken by Hughey et al. (2002) noted that several factors impinged on their capacity to achieve their objectives. These included: (a) network communications; (b) integration of initiatives within the context of their issue settings; and (c) a failure to match resources to the tasks divested to certain groups. On the issue of gender relations, meanwhile, a study of an Otago CEM group identified that far from addressing issues of female inequity in decision-making, the group had provided for the perpetuation of this trend (Brasell-Jones, 1998). This recurrence contradicts the expectations held by those who have championed community participation as a means for enhancing social equity (e.g., WCED, 1987)¹⁰.

Inspecting the role of evaluation in New Zealand more closely, what is noteworthy about the evolution of CEM in New Zealand has been the deficiency of explicit recourse to theory in the development and assessment of this policy approach. In organisations such as Environment Canterbury¹¹, a regional

¹⁰ For further critical accounts of CEM in New Zealand see Lenihan (2002), Warren and Proctor (2000) and Fitzgerald (1999).

¹¹ Prior to 2000 Environment Canterbury was known as the Canterbury Regional Council. Although still a regional council, 'Environment Canterbury' is presently the organisation's operating title. To avoid confusion in this document I have referred to the authority consistently as 'Environment Canterbury' for all events and statements involving it and reiterated in this project.

management authority in the Canterbury province of the South Island, community-based group initiatives presently form a major part of its strategy for addressing environmental change (see Environment Canterbury, 2003)¹². What is apparent on review, is that this strategy has evolved out of a practical and incremental response to the issues, skills, opportunities and constraints facing the agency. This is a point that appears to be replicated across an array of the community-based initiatives within New Zealand (see Chapter Four). In this sense, the recent evolution of CEM appears to have reflected an adaptive response to the contemporary contexts that ground environmental management in this country. Concurrently, this appears to have nurtured a preference for inquiries that have followed 'research through doing' methodologies, notably those grounded in the themes of 'participatory' research (e.g., Allen et al., 2001; Ritchie, 1998). A consequence of these dual developments has been the perpetuation of CEM's development and understanding as essentially a 'theory-free' zone¹³.

The points raised in this section reflect on some of the critical question marks that hang over CEM, both generally and specifically within New Zealand. Further, they point this study to areas where further inquiry is warranted. As a researcher, resource manager and environmental citizen, I found the unanswered nature of these questions concerning. There are three reasons for this. Firstly, in situations where society relies on CEM to achieve certain biophysical ends, it appears dangerous to be uncertain about whether these are being met. Secondly, without the understanding garnered from critical assessments, it becomes difficult for CEM practitioners to defuse criticisms directed at the approach. This leads to CEM being susceptible to denouncement based on 'knee-jerk' or ideological reactions, rather than based on informed insights. Finally, without on-going assessment it is difficult for practitioners to adaptively manage CEM in accordance with the insights that analysis can provide. In the context of these points, critical research is necessary to advance the understanding of the opportunities and limitations that reside within the concept.

¹² Environment Canterbury uses the term 'resource care groups' to define these organisations.

¹³ Exceptions to this situation do exist, such as the work of Selsky and Memon (1997) that drew on themes from within the common property institution literature to investigate environmental management in a South Island port.

2.5 Towards a Framework of Inquiry

Are these new approaches all that they are held up to be? Do they really lead to improved resource management? What can and cannot be reasonably expected of them and what variables influence their effectiveness? (Conley and Moote, 2003, p. 371).

Upon reflection, the critical points raised in this chapter highlight the need for theoretical approaches that enable the further investigation of CEM. Obviously, not all the prior points can be investigated in a single study, so it is necessary to prioritise areas for research. Adopting this approach, I identified four theme areas worthy of special investigation. These are:

- the understanding of what qualities affect the form and focus of collective action within and around CEM initiatives in New Zealand;
- identification of the form and effects different interpretations of the physical world has on the effectiveness of CEM institutions operating in New Zealand;
- how matters of power affect the effectiveness of these arrangements; and
- what factors affect the capacity for CEM to contribute toward notions of effectiveness premised on the themes of sustainability.

The selection of these four themes reflects the culmination of four factors. The first is the importance, across all the narratives I have described, of collective action to CEM processes and outcomes. Secondly, the interest in how different interpretations of the physical world affect CEM, originates from a general failure, thus far, to investigate the impacts of the social construction of nature on this policy approach. Consideration of the political dimensions of CEM is considered important, thirdly, because of the recognition that politics is a central element shaping human collective behaviour, while again it is an area where CEM analysis has been limited. Finally, the interest in sustainability reflects the contemporary interest in this concept as a basis for managing human interaction with the wider environment. The theoretical framework I use to investigate these matters further is described in Chapter Three (see Section 3.1.1).

2.6 Summary

Popular and theoretical discussions, along with experience, demonstrate the prominence of CEM as a contemporary resource management tool; it is also an approach that has attracted increased criticism (e.g., Kellert et al., 2000). As critiques of CEM have mounted overseas, so to have the call for assessments of specific initiatives and the broader approach itself. In contrast, within New Zealand rigorous intellectual analysis of CEM has been rare, with the recent development of CEM not being aligned to any clear theoretical heritage beyond the context of an overriding neo-liberal reform environment. This has meant that it has been difficult to trace and evaluate the accomplishments of CEM initiatives against theoretically grounded criteria. Consequently, the critical issues raised in this chapter have not been subjects of intensive analysis, especially within central and local government policy circles. Those studies that have proceeded have tended to focus upon a limited range of variables or have been general in scope (e.g., Warren and Proctor, 2000). What has occupied the resulting space that critical analysis could occupy has been the trend of celebrating CEM accomplishments rather than evaluation its outcomes (e.g., Figure 1.1). This has precipitated a vacuum of critical understanding about the form, function and effectiveness of CEM. It is this situation that this study sought to redress through a critical investigation of six CEM case studies. In the next chapter, I describe the methodology used to accomplish this task. This includes details of the research approach, theoretical lenses and methods used to organise this study.

Chapter Three: Methodology

The task of scientific study is to lift the veils that cover the area of group life that one proposes to study. The veils are not lifted by substituting, in whatever degree, performed images for first hand knowledge. The veils are lifted by getting close to the area and by digging deep into it through careful study (Blumer, 1969, p. 39).

3.1 Introduction: Research Approach

Qualitative methodology . . . is more than a set of data-gathering techniques. It is a way of approaching the empirical world (Taylor & Bogdan, 1998, p. 7, emphasis added).

This chapter describes the approach and methods used to guide my investigation of CEM, and the units of analysis on which the inquiry was based. As a preliminary to this task, it is useful, as Swaffield (1991) argues, to present a *methodological statement* that summarises the 'vision' of the world upon which this inquiry developed. This is beneficial because all approaches to research occur within a particular vision of the world, which in turn influences the way a subject is studied and the insights made of it. In this context, a methodological statement is useful as a tool for enhancing transparency, both in terms of the understanding of where a study is 'coming from' and the perspectives of the world that a researcher brings to a project (Swaffield, 1991).

To this end, the methodological approach adopted in this study is centred within the social science perspective of phenomenology¹⁴. The phenomenological approach is: *committed to understanding social phenomena from the actor's own perspective and examining how the world is experienced* (Taylor and Bogdan, 1998, p. 3). Phenomenology is linked to a range of theoretical areas within social science. These include symbolic interaction (Blumer, 1969), interpretative anthropology (Geertz, 1973) and social constructionism (Berger and Luckmann, 1966). Proponents

¹⁴ Phenomenology can be distinguished from *positivism*, a perspective that concentrates on the deduction of 'objective facts' through scientific modes of observation (e.g. surveys and experiments) (Hughes, 1990).

of these perspectives share the goal of seeking to understand the world of lived experience from the viewpoint of those who live it (the *emic* view) (Tolich and Davidson, 1999).

Also important in the task of defining a research approach is the question of how theory is managed (Hayward, 2000). Within the phenomenological approach itself, the focus is not on the testing of theory *through* data, but on the development of theory *from* data (Tolich and Davidson, 1998). This orientation sees theoretical considerations become secondary to the processes of data gathering and analysis. Despite this emphasis, these processes cannot occur in a vacuum; the researcher implicitly or explicitly brings a frame of reference to the social world they explore (Swaffield, 1991). To accommodate for the effect of such frames, Glaser's (1978) notion of 'theoretical sensitivity' is useful and has been adopted in this study.

Theoretical sensitivity embraces the argument that the disciplinary and professional knowledge and experiences of the researcher can assist in the exploration of social phenomena. The concept of theoretical sensitivity also draws on previous work by Glaser and Strauss (1967) and their concept of grounded theory. Grounded theory is premised on the argument that it is the task of the researcher to develop theory from data. However, as Strauss and Corbin (1994) argue, this does not mean that research should be devoid of theory at its outset. Instead, it is the responsibility of the researcher, they suggest, to develop new theories through the constant comparison of data and theory brought to the analytical process:

In this methodology, theory may be generated initially from the data, or, if existing (grounded) theories seem appropriate to the area of investigation, then these may be elaborated and modified as incoming data are meticulously played against them (Strauss and Corbin, 1994, p. 273, emphasis in original).

The decision to use a phenomenological approach in this research holds two particular advantages over the use of positivist methods (e.g., surveys and experiments). Firstly, the approach defuses the attribution problem that faces positivist methods (Gottret and White, 2001). This problem emerges out of the emphasis in positivist methods upon measuring the relationships between independent and dependent variables (Babbie, 1998). To measure these, a researcher

must be able to control for other variables that impact on the relationships they seek to assess. This, in reality, is often difficult to achieve in research. An example would be the measurement of the association between the riparian planting efforts of a CEM group and changes in trout numbers in an adjacent waterway. In this instance, attribution problems arise because of the difficulty of isolating the relationship between these two variables from others in the catchment (e.g., upstream practices). The resultant uncertainty this situation generates impacts, in turn, on the reliability of a researcher's findings. For phenomenologists, seeking to build understandings based on what they see and hear rather than what they measure, these problems are not particularly relevant (Blumer, 1969).

The second advantage resides in the opportunity that the phenomenological approach provides for avoiding goal traps. Goal traps arise when an attempt is made to measure the outputs of a policy with indicators that are forced or irrelevant (Deutscher, 1977). A case-in-point would be the use of a single water quality parameter as a determinant of the overall condition of an aquatic system. As a measure, this statistic would mask the contribution of an array of other variables that could be relevant to the assessment of this parameter. By comparison, phenomenological methods avoid such problems by directing attention to the understanding of processes and outcomes rather than the assessment of specific outputs (Deutscher, 1977).

In summary, the phenomenological approach employed in this study challenges the human tendency to take the everyday world for granted, by permitting research to go beneath the processes and outcomes of everyday life (Abercrombie et al., 1994). In this capacity, it complements the focus of this study to explore and inspect social behaviour in terms of its own intelligibility, including peoples' actions toward each other and the physical world (Tolich and Davidson, 1999).

3.1.1 Theoretical lenses of inquiry

The critical review in Chapter Two identified four thematic areas for guiding the focus of this inquiry (see Section 2.5). The investigation of these required the selection of a set of theoretical lenses that were appropriate for grounding an in-depth

interpretative study of my six case studies. Those selected for this purpose were: (a) the theory of social capital; (b) theories of the social construction of nature; and (c) notions of sustainability. It is relevant to note here, in turn, that while one or two of these lenses have been used together to analyse CEM arrangements (e.g., Leach et al., 2002), no study has thus far used all three in tandem. Meanwhile, of the limited CEM studies undertaken within New Zealand most have used, at best, only one of the lenses used in this study (e.g., Millar, 2001)¹⁵.

The rationale for the use of the above theoretical lenses in this research was based on the following considerations. Starting with the social capital lens firstly, this theoretical lens yielded the opportunity to explore how qualities within social relations affect collective behaviour within and around CEM. This is of interest to this study because, as iterated in Chapter Two, factors influencing collective action play a key part in CEM, including its capacity to promote sustainable outcomes (cf., Buenavista, 1998). This lens was also attractive because of the current popularity it enjoys within certain policy circles (e.g., World Bank, 1998). Its use in the research subsequently provided an opportunity to gauge its influence within a set of exploratory case studies and to see how valid the normative claims made about it were. The social construction of nature theoretical lens, secondly, offered a means for inspecting how alternative understandings of 'nature' arise and influence the process and outcomes of CEM. Further, it also provided a frame for exploring how power relations imbue CEM (cf., Braun and Wainwright, 2001). The sustainability lens, thirdly, provided a theoretical framework for the assessment of well-being based on social, economic and biophysical factors. The use of this lens also provided an opportunity to explore the practical issues arising from efforts to accomplish sustainability through the policy approach of CEM.

¹⁵ Leach's et al. (2002) study, which encompassed water partnerships in the United States, drew on the lenses of social capital, the institutional analysis and design framework, and coalition advocacy theory. Millar (2001), meanwhile drew solely on social capital for her study of various CEM-style groups operating in the Southland region (South Island) of New Zealand.

3.2 Methods: Data Collection

3.2.1 Case Studies

In approaching the topic of methods, it is first necessary to resolve the question of the 'object' to be studied, with the object chosen forming the unit of analysis for an investigation (Lofland and Lofland, 1995). In this study, the unit of analysis comprised case studies of CEM groups operating in the South Island of New Zealand. The use of case studies is especially suited to this research because of the opportunity they provide to 'dig deep' into discrete and defined events and situations (Ewing, 1997). The expectation from this is that even a single example of a phenomenon can highlight points that are significant and contribute to the development of understanding (Flyvbjerg, 2000).

Case selection in this study was grounded on an information-oriented approach. This is a non-random sampling technique that entails the use of pre-determined criteria to select the cases to be used (Babbie, 1998). The first of these criteria was based on Yin's (1988) contention that all case studies should serve a particular purpose - that is, offer something of value to the research topic. The second criterion was drawn from Robert Park's paraphrased dictum that the best place to start research is from within the world and experience of the researcher (Lofland & Lofland, 1995, p. 11-15). This consideration carries the advantage of providing the researcher with a 'head-start' in his or her knowledge and awareness of their topic. Thirdly, from an evaluative perspective, I was interested in the opportunities for comparisons between groups, especially those that appeared to have elements in common. Fourthly, there were practical considerations behind the selection of my research examples. By selecting a number of cases in Canterbury, for example, I was saved the time and expense of having to travel further afield to gather data. Another advantage of this strategy was that it allowed multiple visits to be made to research sites, with the gaps between visits providing the opportunity to analyse data and further the development of my research instruments (see Section 3.2.2). The need to balance this by including a group from a different institutional and geographic setting, meanwhile, prompted the selection of a case from outside the Canterbury region. Fifthly, because of an interest in exploring the impacts of CEM it was decided to limit case selection to groups that had been underway, in some form,

for at least three years. One consequence of the use of these criteria was the subsequent omission of a group from this study that reflected co-management arrangements between the state and indigenous Maori. This was a deliberate decision that reflected the recognition that this area of CEM entails a range of issues that would merit a single study on their own¹⁶.

My initial approach to potential case study groups was made by contacting individuals able to take my research interest to their organisation for discussion (such people are typically described as 'gatekeepers' [Babbie, 1998]). Preliminary contact was made through a letter providing details of the study, the associated interest in the group and information on what the study would entail in terms of member participation. Three to four weeks after this letter was posted contact was made with the gatekeeper to receive feedback on a group's interest in the study. In some cases, the contacted person was able to confirm the group's willingness (or otherwise) to participate. On three occasions, however, I was requested to attend meetings where further questions were asked about my research.

A scoping exercise, lasting over twelve months, identified twelve groups that fitted my selection criteria. Of these, four did not proceed beyond the preliminary approach stage because they failed to fulfil all of my selection criteria. Of the other two, the decision to not proceed with one group followed the attendance of a meeting with its members (the group was already the subject of research by another social scientist). The other group was removed from the study following the first observation exercise, when I recognised that personal and professional links to some of the participants would complicate the analysis process. The subsequent groups that came to form the case studies for this inquiry were: (a) the Maine Valley Local Initiative Programme group; (b) the Waitutu Abstractors Group; (c) the Kemp's Drain project; (d) the Barry's Stream Care Group; (e) the Hague Stream Habitat Improvement Project; and (f) the Waimara Estuary Care group. Details of the six groups are provided in Chapter Four.

¹⁶ As an introduction to research into such an arrangement Moller et al. (2000) is recommended.

In this investigation, the case study names and those of individual informants were converted into pseudonyms (as above), the decision to do this being based on ethical and practical concerns. The former included the wish to protect groups and informants from any social repercussions that their comments and identification could lead to. The latter was inspired by a wish to encourage informant openness by the promise of anonymity (see Tolich and Davidson, 1999). The promise of anonymity has had implications for referencing in this research as some material, if cited in the thesis's bibliography, would lead to a case study being identified. To avoid this, but still differentiate external research from my own, all bibliographic references referring to the normal name of a case study area have been altered to repeat the pseudonyms cited above. I have further identified these words in the bibliography by underlining these amendments¹⁷.

All of the groups selected complied with three or more of the criteria described above. Consistent with the second criterion, for example, I had previous experience (vocational) with the Barry's Stream, Waitutu and Hague Stream groups. The shared focus on salmonid habitat restoration between the Kemp's Drain¹⁸ and Hague Stream studies, meanwhile, allowed comparisons to be made between these two groups (criterion three). The location of five of the studies in the Canterbury region, balanced by a case outside of this area (Waimara Estuary Care) was consistent with the fourth criterion. All of the case studies, except the Barry's Stream study, meet the fifth criterion of having operated for at least three years prior to the study's commencement. An exception from this criterion was made for the Barry's Stream Care study (commenced in 1999), because of its close fit with the other four criteria. Finally, the Maine Valley study was selected, not only because it fitted several of the other criteria, but also because it offered an alternative biophysical focus (i.e., vector control) to the water-centred themes of the other five studies.

¹⁷ For his advice on this matter thank you to Professor Harvey Perkins (pers. comm., October 2003).

¹⁸ Although the Kemp's Drain initiative ended in 1994, the resulting time difference between this time and the period of this study meant that there was an opportunity to compare the biophysical change sought by the project against what had occurred over a time period of eight or so years (see Figure 4.4). As many present examples of CEM are in their comparative infancy, this opportunity for temporal comparison was judged to vindicate the use of this study over others that are actually operating.

Once groups were selected for study, a scoping exercise involving document reviews, conversation and observation exercises took place. The purpose of this was awareness raising rather than data collection, with the information gleaned at this time being incorporated into my first observation and interview guides (see Section 3.2.2). The length of this selection and scoping process meant, in some instances, data collection did not proceed until twelve months after an initial approach was made to a group. Meanwhile, during the course of the study I sought to stay in contact with my case studies through a combination of newsletters, 'catch-up' telephone calls and e-mails. The iterative nature of qualitative research also meant that I was obliged to return to my study sites at numerous times. This helped to maintain the relationship with the respective groups. A copy of the thesis was promised to all groups in appreciation of their time and interest in the study.

3.2.2 Forms of Data Collection

The phenomenological exploration of social phenomena is usually accomplished through qualitative methods, the goal being the acquisition of 'rich' descriptive data for analysis (Geertz, 1973). Observations and in-depth interviewing are the two most frequently used methods to achieve this, however others such as life histories (Sedgwick, 1983) and archival studies may also be used (Patton, 1990). Any of these methods may be used separately or in tandem within a study, the dual use of methods being especially useful when one method proves less effective in eliciting data than another (Egan et al., 1995). The main methods of data collection used in this study were observation and semi-structured interviews. In addition, the content analysis of secondary sources, such as newspaper articles and statutory submissions were used to assist aspects of this inquiry.

a. Observation

Tolich and Davidson (1999) argue that qualitative data collection involves a combination of 'looking' and 'asking' exercises. Observation deals with the looking part of the exercise and involves the collection of data through the transcription of field experiences into expanded written form (Emerson et al., 1995). The observation method used in this research followed the format described by Tolich and Davidson (1999), including: (a) preparation of an observation guide prior to entry into the

study site; (b) an attempt to document fully everything observed during initial observation exercises; and (c) the collection of mental and jotted notes in the field and their expansion into detailed written notes following my exit from it.

Examining these points in detail, firstly the preparation of the observation guide assisted in the prompting and directing of my field observations ensuring, in turn, that this exercise yielded the richest data possible. The sequential and expanding nature of data notation is a necessary part of the observation process (Tolich & Davidson, 1999). The mental and jotted form of note collection helped to guarantee that I was not diverted from events in the field, while also ensuring that undue concern was not raised by my notation procedures amongst CEM participants¹⁹. The completed notes for analysis took the form of an expanded chronological log of what was observed, with a running description of events, objects, people, items overheard and conversations between participants and myself. These notes were supplemented with descriptions of my own experiences, impressions and feelings while in the field.

Certain practicalities imposed constraints on the extent of field observations. In the case of the Kemp's Drain case study, for example, the termination of workdays in 1994 meant that 'in the field' observations of the group were not possible. Nevertheless, a visit was made to the site of the group's activities and a description compiled. In other circumstances, observation exercises tended to be opportunistic, owing to the irregular nature of group activity. Nevertheless, I had an aim of achieving at least four observation field exercises (e.g., meetings, and field days) per group during the course of this study.

b. Interviews

Semi-structured interviews were used to accomplish the 'asking' side of data collection. This interview type is best thought of as a guided conversation, in which the purpose is to acquire rich and detailed information that describes an informant's

¹⁹ Some observation exercises, like public meetings, created an observation opportunity where more expanded note taking was able to occur.

experiences of the world (Taylor & Bogdan, 1998)²⁰. A modified interview procedure, based on Lofland and Lofland (1995), was used to elicit data through this method. In the first instance, potential interviewees were identified through a snowballing process, a purposive sampling technique in which potential future informants are identified during the on-going collection of data (Babbie, 1998). The willingness of potential informants to participate in an interview was sought through a letter or in some cases by a request directed through another member of a group. Those who agreed were interviewed for no more than an hour, and in cases where this proved insufficient another interview were arranged.

All interviews were taped, while jotted notes were also taken to highlight certain points and cover observations not gathered through the taping medium (e.g., the behaviour of the informant). As for the observation fieldwork, a guide was used as a means of ensuring that certain themes were explored²¹. Interviews were transcribed in full as soon as possible after returning from the field. In addition, an interview summary sheet describing such characteristics as the location of the interview, mannerisms of the interviewee and my own feelings during the interview was prepared. This was added to the transcript and became part of my interview data. Prefacing all of these, finally, was a fact sheet describing biographic details about the interview (e.g., time and place).

c. Secondary sources

Other data sources, primarily in the form of documents and archival video material, were also used in this study. These were assessed for details in their content and served three purposes. Firstly, at the outset of the research they assisted in sensitising me to themes that might be worthy of investigation, which assisted in the development of my observation and interview guides. Further, this data provided me with background knowledge about each case, so that I was able to enter the field with sufficient competency to establish my legitimacy as a 'serious' researcher. Finally, in

²⁰ This interview technique contrasts with that of the structured interview, in which quantifiable answers are sought to prescribed choices (e.g., an opinion poll).

²¹ Both sets of guides took on the quality of a living document, being adapted to the interests of the research as analysis proceeded.

thematic areas where observation or interviewing was less effective in gathering data, secondary sources provided an alternative source of information.

d. Additional comments

A final matter of relevance to the whole data collection process was the question of when it was decided to end data collection. This decision was decided by applying the logic of 'theoretical saturation' (Glaser & Strauss, 1967). This state is reached when the researcher considers that the most recent data collection exercise has only replicated information from previous exercises and has not added further to their understanding. However, some situations were encountered where further inquiry of individuals or interests seemed to be warranted, but could not occur. Reasons for this included difficulties in negotiating participant access and refusals to requests for involvement. In these circumstances alternative data sources, such as letters, were turned to as a means of gaining insight into the 'world' of these actors.

3.3 Methods: Interpretative Analysis

The process of analysis used in this study followed the steps of qualitative inquiry described by Tolich and Davidson (1999) and Lofland and Lofland (1995), and entailed an iterative process of data reduction, organisation and interpretation. In the first stage, data reduction, I focused on coding information into groupings or themes identified through the exploration of my collected information (Blumer, 1969). The organisational stage of the process concentrated on the collation of information into more specific forms such as text. The final stage, interpretation, focused on collating data into conclusions drawn from the patterns and regularities revealed through the previous two steps²². Quotations and episodes gathered from the data were used to provide support for, and emphasis of, key conclusions from the study.

²² In an ideal research environment the entire process is intended to occur in an iterative way with outputs of analysis being used to fine tune the data collection process. However, Bogdan and Birklen (1982) note that this process is not always suitable for less experienced researchers. Meanwhile McHenry (1994), with reference to her own work and that of others, notes that often the bulk of analysis only proceeds *after* data collection is completed. In this study, I found similarly that it was not always possible, due to resources and time demands, to engage in a perfect cycle of data collection and analysis.

Exploring the notion of interpretative analysis further, consistent with the phenomenological approach this seeks to reveal people's meanings, and through this develop understanding of their worlds of lived experience (Atkinson, 1990). Epistemologically, the focus here is on knowledge as a social and subjective construct, where language and actions contextualise the meaning of data. From an ontological perspective, meanwhile, the focus here is on a reality construed as pluralistic and relative, with purposeful action following from people's interpretations (Smith, 1997). In this context, analysis focuses on sorting out the 'structures of signification' and determining their social basis and origins, with findings taking the form of rich accounts (or 'thick descriptions') of people's realities, the factors shaping them and how they act within them (Geertz, 1973).

Two other analytical processes were used to supplement those described here. The first involved an approach that allowed comparisons to be drawn from the data collected *across* the six case studies. The comparative instrument used here was analytical induction, a method that focuses on the identification of causal links that arise between variables and the summarisation of these into statements that accommodate all negative cases (Denzin & Lincoln, 1994; Perkins 1988). Analytical induction is promoted by some qualitative researchers as a means for theory building from qualitative data (see Becker, 1998); its use in this study was less grand however, and concentrated on the ability to obtain meta-insights relevant to all six case studies in this investigation. The second analytical process used, also a comparative method, focused on how insights from a former lens of analysis could contribute to understandings garnered through another. I have coined the term 'snowball analysis' to describe this cumulative knowledge building process. This term must be differentiated from the other use of 'snowball' in the language of social science, where it is used to describe a non-random sampling technique (c.f., Babbie, 1998).

3.4 Methodological Issues

The research methods documented in this chapter raise various methodological issues, including the questions of reliability versus validity, and the relevance of reflexivity. Examining the first matter, reliability is the quality of

research that suggests that the same conclusions will be collected from repeated rounds of data collection involving the same phenomena (Babbie, 1998). The capacity to achieve reliability is commonly regarded as a strength of quantitative research and a weakness of qualitative approaches (Tolich & Davidson, 1999). In contrast, the ability to achieve valid representations of the social world through the intimate knowledge of social actors and their everyday lives is seen as a strength of the qualitative method (Atkinson, 1990). It is the opportunity for validity that underscores the strength of this study, where the methodological purpose has been to provide interpretations of the patterns and processes that emerge from the six case studies. The knowledge gained through this approach is anticipated to be valid as an understanding of CEM in New Zealand.

The mixed methods approach to data collection used in this study is also recognised as a means for enhancing validity within qualitative studies of the social world. The term triangulation is used to describe this process, whereby different data sources are drawn on to develop interpretations (Tolich & Davidson, 1999). Triangulation enhances validity in various ways, the most tangible being the opportunity to inspect phenomena from various data perspectives. It also assists the researcher in situations where one method of data collection may have deficiencies that another method overcomes (McHenry, 1994).

Validity has also been promoted in this study using comparative case studies. The contribution these make to validity building can be understood through the idea of 'anticipatory accommodation'. This concept emerges from critiques of validity by critical theorists, a number of whom have focused on the ways that humans reshape cognitive structures to interpret and understand the social world across different contexts (Kincheloe & McLean, 1994)²³. Anticipatory accommodation draws on this perspective and sets forward the argument that through the knowledge of a variety of comparable contexts a researcher can gain insights into the differences and

²³ Emerging as an alternative to orthodox social science and scientific Marxism, critical theorists seek to develop simulated concepts of society as a historically developing social whole, with theorists interested in not only understanding society but also in changing it. Their interest in the concept of validity has emerged from the reasoning that an observer's observations and measurements cannot provide true descriptions of reality (Kincheloe and McLean, 1994).

similarities that connect to people's actions (Hayward, 2000). Because of this process, it is suggested, a more valid description of people and the research setting emerges (e.g., Hayward, 2000). The use of multi-site case studies in this research is consistent with efforts to achieve anticipatory accommodation.

The notion of reflexivity is a central concept within qualitative inquiry and deals with the need of the researcher to manage for the influence of their values and beliefs in the investigative process (Tolich & Davidson, 1999). These can endanger the validity of an investigation by increasing the subjectivity of a study, for example, by constraining the capacity of the *researched* to be heard and the *researcher* from achieving a 'direct experience' of his or her topic. To enhance the reflexive nature of this study, I followed two measures described by Tolich and Davidson (1999, p. 64). These were: (a) the maintenance of an on-going awareness of how my values and preferences entered my study; and (b) a critical awareness of the assumptions I brought to the study itself. Part of this process involved me being honest with the reader about my perspectives and experiences, a task I addressed in Chapter One (see Section 1.5).

A specific methodological issue for this thesis arose from the decision to employ a constructionist approach to the exploration of CEM (see Chapter Six). In deciding to analyse the effectiveness of CEM using a social construction lens, some might argue I was in danger of adopting an approach at odds with the contentions of social constructionism itself (see Irwin, 2001; Velody & Williams, 1998). The foremost reason for this is the principle of *symmetry* that is suggested to adhere to the approach. This principle decrees that the analyst should 'see the world' from the perspective of others and not judge one as necessarily better or worse (Castree & MacMillan, 2001; Stein & Edwards, 1999). This contrasts with the *asymmetrical* approach of positivist methodologies, which prioritise certain judgements over others. Because of the symmetry principle, Latour (1991, p. 130) argues that: *we [should] refuse to accept judgements that transcend the situation*. For Eden et al. (2000) this means the analyst can only look back rather than forward, because of the uncertainty about how a representation will form and be articulated in the future. In contrast, Irwin (2001) disputes these claims against judgement, arguing that it is

acceptable, on the proviso that the analyst is explicit about the normative commitments he or she brings to the research situation²⁴. It is this latter argument upon which I have premised my use of the social construction approach in this investigation. This is based on my opinion that it offers a better basis for the development of an argument of use to researchers and practitioners.

3.5 Reflections on the Research Approach and Methods

Three summary reflections can be deduced from the methodology used in this study. The first is the contention that in-depth, qualitative based research of multiple cases can provide a means for understanding CEM processes and outcomes. The second is that such research needs to recognise the significance of context, since actors and their actions cannot be understood in isolation from the physical and social worlds they inhabit (Flyvbjerg, 2001). Finally, given the methods and limited case studies entailed in this study, it is not epistemologically feasible to contemplate the generalisation of this study's findings to all forms of CEM. Instead, the value of this study exists in its interpretative - analytical detail of patterns and themes, which in turn can inform our understanding of other CEM arrangements. The employment of a reflexive approach, the use of multiple case studies and triangulation of multiple data sources have, in turn, contributed to the robustness of this study's findings.

²⁴ As one would anticipate, this approach to evaluating effectiveness has raised concerns amongst those of a realist – positivist persuasion, as their notions of objective 'facts' and valueless criteria are at odds with it (Horlick-Jones, 1998). However, much of this concern may be overcome, Murdoch (1997) and Irwin (2001) argue, when social construction is understood not as an ontological judgement (about how the world is), but an epistemological one (how we understand the world). In the latter sense, the principle of symmetry requires the analyst to critically explore his or her ways of interpreting or 'knowing' the environment. In doing so, this approach highlights a need for epistemological sophistication that moves beyond realism-positivism to something that is more flexible and reflexive (Tolich & Davidson, 1999).

Chapter Four: Contexts of Study

Cases exist in context. What has been called the 'primacy of context' follows from the empirical fact that in the history of science, human action has shown itself to be irreducible to predefined elements and rules unconnected to interpretation (Flyvbjerg, 2001, p. 136).

4.1 Environmental Governance and Community Environmental Management in New Zealand

4.1.1 New Zealand context

a. Biophysical setting and issues

Located in the Pacific, New Zealand comprises an archipelago dominated by three major islands. Total land area covers 269,000 square kilometres, the country being 1600 km long and 450 km in width at its widest point; climatic processes within a southwesterly ocean system dominate the country's weather (Furuseth and Cocklin, 1995). The prominence of agriculture within the New Zealand economy (see below, b) has underscored the relationship of people with its land, water and air resources, these providing material flows and services that have sustained the post-colonial development of the nation (Le Heron and Pawson, 1996). In turn, agricultural activities have had numerous negative impacts on the country's biophysical environment (Ministry for the Environment, 1997). This has been exemplified by the contribution agricultural practices have made to the decline of freshwater aquatic ecosystems (Parkyn et al., 2002) and the gradual reduction in the country's endemic biodiversity, as forests and wetlands have been developed for farming (Park, 2002). In turn, a variety of policy mechanisms have been championed as potential means for addressing these changes, ranging from regulations to economic and community-based methods (e.g., Ministry for the Environment, 1995).

b. Economic and social

One hundred and sixty years of European settlement in New Zealand has been underscored by the progressive development of an export economy centred on the production of primary products including meat, wool and dairy goods (Easton,

1997). An historic feature of this economy has been the commitment of the state to supporting the productive sector through a combination of subsidies and tariffs (Le Heron and Pawson, 1996). Events since the 1970s, however, including two oil shocks (in 1972, 1979) and the wholesale reform of the public and welfare sectors (from 1984) have removed much of the certainty and security that were features of pre-1980s New Zealand. It has also placed enormous stress on various social sectors, especially those linked to primary production (Russell, 1996). These adjustments have had consequences on the social fabric of rural New Zealand, including changes to the relationships between producers themselves and the biophysical environment they interact with. This has included an increased emphasis on economic imperatives over ecological considerations, and increased conflict over rural property rights and responsibilities (Cocklin et al., 2000). Alongside these changes, the post-war social consensus that was a feature of New Zealand (1950s to 1970s) has given way to a more dynamic and diverse socio-cultural environment (Le Heron and Pawson, 1996). This has been exemplified by the re-emergence of indigenous Maori as a social and political force in New Zealand society (Thorns, 1994).

c. Political ecology

Structural adjustments in post-1970s New Zealand have contributed to changes in the political ecology²⁴ of the country's physical spaces, particularly those found in rural New Zealand. Traditionally, the country's rural producers enjoyed near hegemonic control over the management of their activities, including their effects on the natural environment (Pawson and Brooking, 2002). Environmental legislation, for example, was heavily oriented to the maximisation of productive opportunities and the control of a 'recalcitrant' nature. Since the 1980s, however, these imperatives have come under increasing pressure. This has been the result of several interacting factors, including: (a) increased calls and opportunities for public participation in resource management; (b) increasing visibility of producer effects on local environments; (c) legislative changes, including increased recognition of non-productive values and interests within environmental legislation; (d) efforts to

²⁴ At the simplest level the notion of political ecology embraces the understanding of the physical environment as a political space (Greenberg and Park, 1994).

address Treaty of Waitangi²⁵ concerns; (e) the growth and increasing sophistication of lobbying methods by environmental sector groups; and (f) international developments, including the rise of the sustainable development policy narrative (Pawson and Brooking, 2002).

Together, these factors have influenced the organisation of space in New Zealand. A trend in this regard has been the re-commodification of rural physical environments; a process that has seen their transformation from traditional forms and interpretations of use, to patterns reflecting new economic, political and social imperatives. Influential here has been productive imperatives that have inspired the intensification and diversification of production by rural producers. This change, in turn, has increased the output of both biophysical 'goods' and 'bads' from their practices (e.g., Parkyn et al., 2002). Concurrently, landscapes once covenanted for their economic value have become appreciated for values, which reflect the lifestyle, recreation and the intrinsic meanings they hold for different peoples. This culmination of processes has led to increased conflict over the management of rural space, a process reflected in numerous efforts by different stakeholders to assert their meanings onto rural environmental management practices (Cloke and Goodwin, 1992; Perkins, Forthcoming).

4.1.2 Patterns of environmental governance in New Zealand

The changing interests and concerns of society, and lessons learnt through time, have contributed to contemporary patterns of environmental governance in New Zealand (see Memon and Perkins, 2000). In pre-colonial times (pre-1840), environmental management centred on forms of customary use evolved within Maori culture to manage the use of mahinga kai (foods, and places for gathering food and materials). This was associated with sets of rules and practices linked to the social units of hapu (extended family), runanga (sub-tribe) and iwi (tribe) (Moller et al., 2000). Early patterns of European resource use, in contrast, were characterised by the

²⁵ The Treaty of Waitangi was signed between a portion of Maori iwi and representatives of the British Crown in 1840. In return for recognising the sovereignty of the British monarch the Treaty established the parameters for Maori treatment by the Crown. It also codified their rights to the country's natural resources. Subsequent legal developments in the 1980s re-emphasised the role of the Treaty in New Zealand law and the rights of Maori under it (Boston et al., 1996). The document, today, provides the foundation for the evolving relationship between Maori and the state, including the resolution of grievances between the two parties (Mulgan, 1994).

wholesale exploitation of indigenous resources, including whales, seals, flax and timber (Flannery, 1994).

Around the mid-1800s, this pattern gave way to a concerted effort to transform the landscapes of New Zealand into productive environments servicing the economic needs of the European settlers (Park, 1995). In this context, forests were cleared and wetlands drained, usually with little consideration of what was being lost; the interest instead being the transformation of 'inhospitable' environments into something conjugal with the economic interests and social understandings of European settlers (Park, 2002). With these changes, resource management evolved around the goals of maximising the opportunities for sustained resource exploitation, while managing for the public health and social consequences of this. These interests reflected similar patterns of evolving environmental administration in other parts of the western world (Kraft and Johnson, 1999). Concerns over the condition of domestic and stockwater supply, for example, were behind some of the earliest efforts to control water pollution in New Zealand (McDowall, 1994). Through the mid-twentieth century, this evolving process saw special attention given to laws that protected the well-being of productive lands from the effects of erosion and floods (e.g., the Soil Conservation and Rivers Control Act, 1941). However, by the late 1960s one can distinguish a mounting recognition of non-productive interests in such legislation; a trend that has evolved, through to today, where ecological, intrinsic and cultural values now form central parts of the country's leading environmental statute, the Resource Management Act (1991).

The Resource Management Act, promulgated in 1991, was the product of a wholesale effort by the fifth Labour government to reform New Zealand's environmental legislation (Furusest and Cocklin, 1995). The legislation, which persists today, has sought to integrate the management of the majority of New Zealand's natural and physical resources²⁶ under a single purpose - that of sustainable management - supported by a set of co-ordinating principles. The Act also sets out

²⁶ Resources that lie outside the ambit of the legislation include minerals (owned by the Crown) and marine fisheries (administered through alternative legislation).

the regime for the administration of these provisions, with a large amount of the management responsibility passing from the central state to local statutory authorities (i.e., regional councils, unitary authorities and territorial authorities) (Bührs, 2000). The Resource Management Act also establishes the framework for the planning and allocation of land, water and air resources in New Zealand, with much of this responsibility falling to the local authorities described above (Memon, 1993). In contrast to the provisions in previous resource management statutes, the legislation also sets out much wider procedures for public consultation and participation (Hayward, 1995). The legislation and the processes promulgated through its provisions provide a key pillar around which CEM is organised in New Zealand today.

4.1.3 Community environmental management in New Zealand: Past and present

Although present day forms of CEM in New Zealand owe much to the legislative and contextual factors so far described, it is also relevant to acknowledge the contribution of historic factors. These demonstrate that CEM is not a new feature of New Zealand's policy environment; rather, a legacy of such institutions can be traced back to pre-European times. Maori management of local resources, for example, was inherently community-based, owing to the situating of customary use rights within family and tribal affiliations (c.f., Matunga, 2000). Through New Zealand's evolving post-colonial history, meanwhile, at least three further phases in the evolution of CEM can be delineated.

The first phase, occupying a period between the early 1900s through to the mid-1980s, saw community-based arrangements characterised by the following features. The first of these involved the nature of the relationship between CEM institutions and local and central authorities. These relationships were formal and often underpinned by special statute (such as local drainage and river control acts). The second was the tendency for those participating in the programmes to be the direct beneficiaries of their actions. The third and final characteristic was the tendency for these institutions to be funded by a combination of local rates and a subsidy from wider society, gathered on their behalf by local authorities (Ackroyd,

1991). Examples of such groups included river district, nassella tussock, and rabbit control boards (Ackroyd, 1991). A variant form of CEM, which also evolved over this period, involved organisations that evolved (on a voluntary basis) to manage some aspect of a state-owned resource. The usual rationales behind the development of these institutions were concerns about improving the efficiency of resource use. A typical example of such organisations was the instance of groups formed by farmers to collectively manage their irrigation takes from a shared water source (e.g., the Shag River Allocation Group, North Otago [South Island]). Similar style groups, some of which persist today, have evolved as co-operative arrangements for the management of fish stocks (Hughey et al., 2000).

Following the local government reforms of the 1980s, the majority of these institutional arrangements were displaced by new organisations or disappeared altogether. The boards described above, for example, were often re-constituted as sub-committees of local councils. In other instances, their tasks were absorbed into the management functions of local authorities, with any vestiges of the former organisation disappearing. The subsequent period, lasting from the mid-1980s to the early 1990s, was therefore one of transition for CEM arrangements within New Zealand. In turn, the changing politico-economic context raised many issues for economically marginal farm environments, with returns being squeezed and the responsibilities for land management being transferred directly to the individual farmer. In the South Island High country, for example, the demise of pest destruction boards coupled with the expense of rabbit control and poor commodity prices, challenged the sustainability of traditional agricultural practices in the hill and high country of the South Island (Donald Ross pers. comm., March 2003).

The Rabbit and Land Management Programme was initiated as a response to this situation. Originally conceived as a means of addressing rabbit control issues, those administering the Programme became progressively aware of the need for an integrated approach to the problem, which embraced the social and economic issues of land sustainability (Williams et al., 1995). With this recognition, a key component of the Programme became the emphasis of working with farmers 'on the ground', using exchanges with community groups to develop fora for the building of trust, and

the exchange of knowledge and experience. On reflection, the Programme's co-ordinators consider that this orientation was effective in re-building trust and co-operation amongst participating communities and authorities, while also allowing some of the physical issues arising from land degradation to be addressed (Morgan Williams pers. comm., February 2003).

A spin-off effect of the Rabbit and Land Management Programme was the awareness it generated of the potential for community-based groups to act as a source of collective action and learning within rural New Zealand (Williams et al., 1995). Spurred on by similar observations spawned from the national Landcare Programme in Australia (Lough, 1991), this recognition culminated with the formation of the New Zealand Landcare Trust in 1997. This organisation was given the task to act as a co-ordinating body to assist in the establishment of community-based groups addressing land sustainability issues (Towle, 2002). Today, throughout New Zealand, there are 500 groups affiliated to the Trust. These groups range across issues and geographic location; from possum control and Kiwi protection in Northland, through to water quality improvement in Southland (Towle, 2002). Other features of the Trust have included its restricted links to the state (it receives limited annual funding through the government budget - \$450,000 in 2003) and the composition of the Trust itself²⁷.

The initiatives spawned by the New Zealand Landcare Trust are, however, only one form that CEM takes in contemporary New Zealand. Concurrently, local authorities such as regional and district councils have also looked towards the opportunities within CEM arrangements to address issues that fall under their statutory gambit. In the Waikato, Canterbury and Southland regions, for example, the respective regional councils have established units that seek to promote the use of CEM groups to meet their statutory responsibilities for land and water management (Environment Canterbury, 2003; Environment Southland, 2000; Ritchie, 1998). Similarly, the Animal Health Board, the national authority managing the problem of

²⁷ The Trust's board comprises representatives across the rural productive and the conservation sectors, a number of who have traditionally conflicted – and continue to do so – over environmental issues (e.g., Federated Farmers New Zealand (Inc.) and the New Zealand Fish and Game Council).

bovine tuberculosis in New Zealand livestock, has turned to community-based vector control groups to implement part of its management strategy (Allen et al., 2001).

Another community-centred innovation that has evolved through the 1990s, has centred on the efforts by state agencies to promote collaborative decision-making arrangements. The focus of this method has been on bringing together different stakeholders linked to an environmental issue and using the opportunity this creates to develop management strategies that reflect and harmonise public concerns (e.g., Kilvington, 1998). Underscoring these efforts has been the inference that strategies developed through these means will receive wider public support than those drafted through traditional top-down methods.

A further form CEM has taken is of groups that have evolved around the concerns of self-organised citizens. Some of these groups have become integrated into the New Zealand Landcare Trust network, as they have gone to it for assistance and support, while others have developed close links to statutory authorities such as regional councils. What distinguishes these groups from the forms already described, however, is that their goals are usually defined by their members and not by the outside organisations they deal with. Examples of such organisations include numerous coastal oriented CEM groups scattered around New Zealand, including the Blueskin Bay Estuary Care group operating in northern Otago (Legat, 1998). This group has evolved from an initial expression of interest in the estuary by local residents in the mid-1990s, through to an estuary group that in contemporary times has focused on a set of defined aims. These include addressing sediment issues in the Estuary's catchment and the documentation of local history (Legat, 1998).

Drawing on the above points and other observations, some qualifications can be made about the nature and function of CEM in contemporary New Zealand. The first point centres on what factors underpin the motivations for, and character of, CEM. On this issue, at least four interacting factors can be distinguished. The first of these is the historic resistance of the rural sector to state control and intrusion. Underpinning this has been the desire by many of those living and operating in rural spaces to have control over their destinies, including the relationships they share with

the biophysical environment and the protection of their property rights (*de facto* and *de jure*) (see Ramsey, 2000; Bristow, 1997). One output of this has been a natural preference for voluntary-based arrangements to manage the effects of resource use and the allocation of natural resources.

The second has been the doctrine of neo-liberal reform that has predominated within central and local government over the last twenty years of New Zealand's history. Emerging from this has been the argument that communities should own both 'their problems' and be the authors of 'their solutions', a point recently reiterated by New Zealand's Minister for the Environment (Hobbs, 2001). This argument, combined with the full or partial removal of the state from such areas as flood control and pest management, has turned the attention of stakeholders (state and non-state) to the opportunities available within community-based arrangements for addressing different environmental concerns (e.g., Ministry for the Environment, 1995).

Thirdly, like other western nations, New Zealand's political landscape has been imbued by the participatory ideals that were described previously in Section 2.2. One consequence of this is that people have come to CEM as a means for conferring their identities and meanings onto different biophysical spaces (Urry, 1995). The support of the New Zealand government for international documents supporting public participation in environmental management, such as the Agenda 21 document, has given impetus to this development. Similarly, at the national level statutes, such as the 2002 promulgated Local Government Act, have increased the role communities can expect to have in district management and the accountability of state authorities to them.

A review of CEM activities in New Zealand indicates that the approach is mounting in popularity across state and non-state sectors (see Table 4.1). In 2003, for example, the New Zealand Landcare Trust had over 500 groups registered on its database, a figure that compared to 319 groups in November 2000 (Warren and Proctor, 2000). Further, CEM programmes operated by the likes of Environment Canterbury, the regional council of the Canterbury region, have shown a steady rise, to a point where there are now 43 groups enrolled in its programme. This growth has

Table 4.1: Examples of linkages between community environmental management and the state

Authority	Policy Area	Legal basis / Programme
Crown	Treaty of Waitangi relations	<i>Ngai Tahu Claims Settlement Act (1998)</i> . Co-management of Titi Islands by Rakiura Maori
Government (General)	Community : Government relations	<i>Statement of Intention for an Improved Community : Government Relationship (2002)</i> <i>Local Government Act (2002)</i>
Ministry for the Environment	Sustainable development strategy	Sustainable Land Management Strategy (1996)
	Sustainable Land Management	Sustainable Management Fund
	Biodiversity Waste Management Monitoring and Reporting	Financial and technical support to the New Zealand Landcare Trust
Department of Conservation	Biodiversity and conservation management	Nature Heritage Fund Resource support to the New Zealand Landcare Trust
Ministry of Agriculture and Forestry	Sustainable resource use	Sustainable Farming Fund
Ministry of Fisheries	Fish stocks management (e.g., scallops)	<i>Fisheries Act (1996)</i>
Environment Canterbury	Land and water management	Resource Care programme Provisions of resource plans
Environment Southland	Land and water management	Public participation and land sustainability strategy Provisions of resource plans
Christchurch City Council	Environmental improvement	City plan methods Coast Care

Key

■ Crown / Central government authorities; ■ Regional authority; ■ Territorial authority.

(Sources: Christchurch City Council, 1999; Environment Canterbury, 2001; Environment Southland, 2001; Fitzgerald, 1999; Hughey et al. 2002; Lenihan, 2002; Moller et al., 2000)

corresponded to a broader increase, since the mid-1990s, of the regard given to CEM as a policy method by different local and central government authorities. Table 4.1 provides a summary of the ways that CEM has been incorporated into some of the policies and strategies of state authorities over the last eight years. Moving on, the next section sets out the context for the six case studies that lie at the heart of this research. It introduces the physical context, group characteristics, and the issues and changes that have occurred around their activities.

4.2 A Review of Research Case Studies

Six CEM case studies, operating in the South Island of New Zealand, formed the units of analysis for this inquiry. The approximate geographic location of each of these studies is depicted in Figure 4.1 and a summary of the features of each is presented in Table 4.2. In the accounts that follow it was found useful to differentiate the six groups based on two categorisations. These were: (a) productive; and (b) social. Although the relevance behind each of these two labels will become clearer in the work that follows, some elaboration is necessary here.

Figure 4.1: Case study locations

The 'productive' label is applied in this study to groups where the key participants were actors whose involvement was motivated by concerns linked to their productive well-being. In most circumstances, this involved people who were undertaking agricultural activities, and who lived and worked in the environment where the management efforts of a group were focused. Linked to this involvement were usually concerns about property rights, resource access and the maintenance of farm productivity. In contrast, the 'social' categorisation has been used in this study to depict those groups where participants' involvement was motivated by a combination of amenity, socio-cultural and intrinsic concerns. Unlike the former group, these actors seldom had property right entitlements over the physical environments they were seeking to manage. A more detailed description of each group follows in the ensuing section.

Table 4.2: Case studies: Summary of key parameters

Parameter	Group Title					
	Maine Valley Local Initiative Programme	Waitutu Abstractors Group	Kemp's Drain Project	Barry's Stream Care Group	Hague Stream Habitat Improvement Project	Waimara Estuary Care Group
Location	North Canterbury (South Island)	North Canterbury (South Island)	North Canterbury (South Island)	Central Canterbury (South Island)	Central Canterbury (South Island)	Southland (South Island)
Production [P] or Socially [S] Oriented	P	P	S	P	S	S
Biophysical Focus	Control of bovine tuberculosis vectors, especially ferrets	Management of water quantity and quality issues in local waterways	Restoration of trout habitat along a portion of Kemp's Drain	Water quality issues in Barry's Stream	Enhancement of a stream's salmon spawning capacity	Restoration, enhancement and promotion of Waimara Estuary
Membership Characteristics	Cattle and deer farm owners in the Valley	Comprised of consented water abstractors	Members of the Canterbury Trout Unlimited chapter	Comprised of landholders adjacent to Barry's Stream	Lower Rakaia River residents	Residents of the lower Waimara catchment
Membership Numbers (Range)	1 - 10	10 - 19	10 - 19	10 - 19	10 - 19	10 - 19
Key Actor / Organisation Interacting with Group	Animal Health Board	Environment Canterbury	Environment Canterbury	Environment Canterbury	Landowner	Environment Southland
Key Membership Trend	Excluded non- deer and cattle herd owners	Excluded non- water abstractors	Lacked inclusiveness (e.g., no local farmers involved)	Excluded non-resident stakeholders	Non-involvement of fisheries and water managers	Lacked inclusiveness (e.g., no local farmers involved)

4.2.1 Maine Valley Local Initiative Programme group

The Maine Valley initiative embraced all eight farms in the same-named valley. Agriculture was the primary economic activity in this location, with farmers focusing on the production of stock for sale to low country farms, while through the 1990s diversification into farm forest and tourism (e.g., hunting) had occurred on some properties. A typical farm-unit in this location comprised 3000 hectares of hard hill to high country (see Plate 4.1).

Commencing in the mid-1990s, the CEM initiative developed from an effort to control the spread of bTB bovine tuberculosis (*Mycobacterium bovis*) (bTB) amongst deer and cattle herds in the Valley. The focus of these efforts was the eradication of the major vectors of this disease, namely possums and ferrets (see Plate 4.2). Participants had a productive interest in controlling vector numbers, as bTB threatened the value and commercial returns on the deer and cattle they marketed, it is also considered by the state to be the source of concern to international trade (Animal Health Board, 1995). Although initially a self-organised programme amongst local farmers, from the late 1990s the group was incorporated into a wider voluntary control scheme known as the *Local Initiative Programme*. This programme has been co-ordinated and budgeted for by the AHB, an incorporated society empowered by the Biosecurity Act (1993) to develop and administer a strategy to address the bTB issue in New Zealand²⁸. Under the scheme, participants (mainly farmers) have been encouraged to eradicate bTB vectors through a combination of education, support services and the reimbursement of expenditure on traps and poison. In return, farmers have been expected to supply kill tallies and attend an annual meeting. The linkage to a national programme has meant that to some extent the activities of the group have been integrated into a scheme that has been supportive of their activities.

²⁸ The Animal Health Board comprises stakeholder groups that contribute levies to the control of bTB. Sectors represented include numerous producer representatives (e.g., Meat New Zealand, Federated Farmers (Inc.) - Dairy Section), as well as local government and central state representatives (e.g., the Local Bodies Association).

Plates 4.1 - 4.12: Case study images (Plates by author unless otherwise stated)

Plate 4.1: Lower Maine Valley landscape (August, 2001).

Plate 4.2: A ferret - prominent bovine tuberculosis vector (Animal Health Board, Undated).

Plate 4.3: Fencing efforts in the Waitutu area have been uneven. Fenced stream margin, Waitutu catchment (August, 2001).

Plate 4.4: Unfenced stream margin, Waitutu area (August, 2001).

Plate 4.5: Kemp's Drain following drainage works in the late 1980s (Jellyman, 1987).

Plate 4.6: Trout Unlimited plantings, well back from the water channel, Kemp's Drain (August 2001).

Plate 4.7: Stock causing damage and silt intrusion into Barry's Stream (November, 1999).

Plate 4.8: Shrub planting, riparian strip, lower Barry's Stream (same location as Plate 4.7) (December 2000).

Plate 4.9: Hague Stream catchment. Stream marked in red (November, 1997).

Plate 4.10: Riparian fencing project, Hague Stream (December, 2002).

Plate 4.11: Waimara Estuary (November 2001).

Plate 4.12: Wetland project site, Waimara Estuary (November, 2001).

Amongst Maine Valley local initiative participants, ferrets were considered the major vector problem, and were therefore the focus of their control efforts. This contrasted with the interpretation of the Animal Health Board, which prioritised the control of possums. Since the programme commenced, in the mid-1990s, ferret kill tallies in the Valley gradually declined, as did the levels of bTB in the Valley's beef and deer herds (see Figure 4.2). Attribution issues mean that one must be wary of establishing a causal relationship between the efforts of the group and this trend. It is fair to surmise, however, that the focus of the group in trapping a prominent vector would represent a practice that would be anticipated to reduce bTB infection rates. The Maine Valley farmer relationship with bTB management authorities (e.g., Animal Health Board and Environment Canterbury), meanwhile, has not always been harmonious. Valley farmers have been critical of the Board's failure to share its concerns about the prominence of the ferret as a vector and its associated lack of expenditure on formal ferret control work. For its part, the Board has operated the Local Initiative Programme in a top-down manner, with farmers having a limited

Figure 4.2: Bovine tuberculosis infection rates in cattle and deer herds compared to ferret capture rates, Maine Valley 1997-2003. (Source: Malcolm Gilbert pers. comm., July 2003).

Note: Ferret capture data reflects 12-month periods across calendar years (e.g., 2001 - 2002), while herd data reflects per calendar year figures (e.g., 2001). No ferret data prior to 1999-2000 was available, although trapping had occurred before this period (individually and under the Local Initiative Programme).

voice, through their facilitators and representatives, on the regional animal health committee²⁹.

4.2.2 Waitutu Abstractors Group

The Waitutu Abstractors Group comprised fifteen farmers drawing water from a series of spring-fed waterways in the Waitutu district. Farmer interest and participation in this organisation reflected, primarily, concerns about production and the associated need for access to water for irrigation. Farmers also shared an interest in the drainage function of these waterways, as their properties were susceptible to flooding. It is noteworthy, for the analysis that follows, that a number of farmers in the Waitutu area *are not* members of the group (numbers are unclear, but are thought to include at least five additional farms). An average farm in the Waitutu area was between 100 and 250 hectares in size and engaged in some form of intensive agricultural activity. Predominant land uses in the area, historically and today, remain dairying and cropping.

The group started initially as an informal water sharing arrangement (1970s), although it progressively (through the 1980s and 1990s) developed more sophisticated arrangements for the allocation of the restricted surface water resource in the Waitutu area. Through the mid-1990s, the organisation broadened beyond this to include the participation of its members in projects aimed at improving water quality. At the centre of this development there appears to have been a desire by members to protect their rights to the local surface water resource, by making positive steps to alleviate the concerns that other stakeholders had raised about the impacts of agriculture on the local aquatic ecosystems. The development of riparian strip management strategies was a key initiative under this effort (e.g., compare Plates 4.3 and 4.4). However, the actions of farmers outside of the group and other land practices (e.g., urban development) were believed by members and agency staff alike to have ameliorated some of the accomplishments of the group (Interviews, June 2001 – November 2002). Although the Waitutu Abstractors Group was self-organised, Environment Canterbury had developed a close working relationship with

²⁹ This organisation comprises an amalgam of agency and farmer representatives. Its task is to determine and oversee the implementation of regional bTB control strategies on behalf of the Animal Health Board.

it. This was reflected in the recognition given to the group in official processes instigated by this authority (e.g., water planning). Finally, despite the intentions of the Waitutu Abstractors Group to improve the aquatic conditions of the local waterways over the previous eight years, indications in 2003 were that the local streams were less than satisfactory for trout and recreational use (e.g., trout angling) (see Box 4.1).

Box 4.1
Waitutu Water Quality Report 2003
 (Monkman et al., 2003)

In 2003 a water quality study of the three largest waterways in the Waitutu area (Waitutu A, B and C) evaluated the condition of these in respect to various water quality parameters. Results indicated that while a single waterway was usually acceptable under one parameter for ecosystem health, it was not necessarily so for another. Waitutu A, for example, demonstrated satisfactory conditions for water turbidity but was ranked in the study as poor in terms of microbial concentrations. Both Waitutu B and C, meanwhile, had levels of turbidity that were considered unsatisfactory for aquatic life along their lower stretches. Waitutu B also had dissolved oxygen levels that were considered unfavourable for aquatic life, in its lower reaches. The report presented no conclusions on overall water quality and aquatic health, but indicated that riparian management 'would' result in improvements in the surveyed waterways.

Note: Criteria against which aquatic health was assessed included guidelines of the Australian and New Zealand Environment and Conservation Council (2002), and those for dissolved oxygen set down in the Resource Management Act (1991).

4.2.3 Kemp's Drain project

The Kemp's Drain Initiative operated between 1991 and 1994 and involved efforts by members of the Canterbury chapter of Trout Unlimited to restore this waterway's brown trout population, primarily through riparian restoration work. Membership and participation reflected social-based concerns about the health and recreational condition of the waterway's brown trout resource. The group was therefore defined in this study as socially-oriented.

Kemp's Drain itself lies to the north of Christchurch and diverts water from what was once a large wetland area of the lower Canterbury plains. Since the late 1880s, the waterway has flowed through a catchment that has been subject to intensive agriculture (e.g., dairying and cropping), with its flow augmented by a network of smaller drains (Cowie et al., 1986). Despite its inhospitable title, the

Drain retains a good reputation as a lowland brown trout fishery, although these values have frequently been compromised by the drain maintenance work of Environment Canterbury. A significant amount of damage was done to these values in the mid-1980s, as Plate 4.5 illustrates.

Regular workdays, involving up to twelve members, were the focus of the management endeavours of this organisation. Although part of an international salmonid conservation organisation, the chapter enjoyed little support from its New Zealand or overseas executive, while the salmonid management agency for the Drain, the North Canterbury Fish and Game Council, had no formal links and little involvement with the initiative. Some resource support was forthcoming from Environment Canterbury, the statutory management agency for the Drain, who also placed some significant caveats over the form of work the group was allowed to engage in. The limited physical scale of the group's activities meant that a range of activities alongside and beyond the confines of its work, meanwhile, had the capacity to adversely impact on the Drain's trout fishery.

Figure 4.3 shows that in the wake of the group's efforts, total brown trout numbers in the vicinity of their project area trended upward between 1991 and 2002. Issues associated with the possibility of a floored effect³⁰ and the matter of attribution means one must be wary of attributing a direct causation between the efforts of the group and these changes. Like the Maine Valley example, however, it is fair to conclude that the activities of the initiative would be consistent with those one would anticipate improving brown trout numbers. From a social perspective, members noted in interviews that involvement was valued for the 'hand-on' experience it provided in restoration work (Interview, June 2001 - November 2001). In contrast, recounted as negative matters affecting the initiative were issues of low financial resources and limited member turn-out to workdays (usually ten or less participants), and Environment Canterbury's efforts to ensure that the restoration work did not compromise the flood capacity of the Drain (Interviews, July – October 2001). This latter factor saw controls being placed on where shrubs were to be

³⁰ The floored effect arises in degraded systems where the only possible way a parameter, such as fish numbers, can change is positively.

placed, with the result that plants were not always located in the positions that would maximise their positive effects on the Drain's salmonid environment (see Plate 4.6).

Figure 4.3: Brown trout numbers, electric fish surveys, Kemp's Drain 1991 – 2002.* (Source: North Canterbury Fish and Game Council, 2002, p. 5)

* Sites four and five were within the zone of the Trout Unlimited project work

4.2.4 Barry's Stream Care group

The Barry's Stream Care Group formed in mid-1999 to address water quality and associated land use issues in the same-named catchment (see Figure 4.4). The group comprised residents living alongside the stream and its main tributary (Wattle Creek), most of whom were farmers (membership has been *de facto*, whereby any property owner living alongside the waterway was automatically construed as a 'member'). Most properties alongside the stream were involved in some form of intensive agricultural activity, such as cropping, market gardening or dairying.

The origins of the group lay in the expression of concern by anglers, and three local farmers sympathetic to their anxiety, at the declining water clarity and numbers of brown trout in the Barry's system. In particular, these actors felt that stock damage to stream banks was a primary cause of these changes (see Plate 4.7).

Compelled to redress these concerns Environment Canterbury, the local management agency, encouraged the stream-side residents to form a community-based group to take action to rectify the human practices thought to lie at the centre of these changes (this occurred in mid-1999). Besides the problem of stock intrusion, this was believed to also include the activity of drain cleaning and maintenance. The bulk of the group's activities subsequently focused on riparian management activities (see Plate 4.8). The group was closely linked to Environment Canterbury, this organisation providing the group with financial and technical support in the undertaking of this work. Levels of participation varied, with some landowners being difficult to trace (e.g., living overseas and renting their properties out), while in other cases the detrimental impacts of drain cleaning on the stream were caused by activities outside of the geographic bounds of the initiative. It is also possible that land activities beyond the group's scope of influence were affecting the water quality and quantity parameters of the stream (e.g., groundwater abstraction).

Figure 4.4: Water clarity in Barry's Stream 1998 – 2002 (based on suspended solids per cubic metre of water – g/m³). (Source: Main, 2003, p. 12).

Note: Source of spikes in the above graph is unclear, but is likely to reflect flood events, drain cleaning operations, or stock intrusion episodes

Discourse indicates that the participation of streamside residents was underscored by concerns about protecting property rights and access to the local

water resources associated with the stream (e.g., for irrigation). For this reason the group was treated in this study as one with a production orientation. As part of protecting these interests, the group adopted numerous strategies to keep outside stakeholders (e.g., anglers) external from its decision-making activities. To date it was estimated that by 2003, 80% of the areas vulnerable to silt intrusion had been fenced (see Plate 4.9) (Interview, November 2002). Analysis of monitoring data indicates that sediment levels had fallen appreciably from the high rates of 1999 (see Figure 4.4). Issues of attribution, however, once again mean it is necessary to be wary of stating a direct causality between the group's work and the changes in the waterway's condition.

4.2.5 Hague Stream habitat improvement project

The Hague Stream initiative commenced in 1997 and involved a self-organised effort by residents, primarily from the lower Rakaia River catchment (of which the stream is part), to improve the salmon spawning capacity of the waterway. Underpinning this focus was the belief that this work should lead to increase returns of mature salmon to the Rakaia River system. Participation reflected a shared social concern about the health of the Rakaia River salmon fishery generally, a desire to promote the return of adult salmon and the idea that the stream was 'special' (i.e., a sense of place). For this reason the group was classified in this study as socially-oriented (membership comprised ten to fifteen active participants). The waterway itself had a small catchment (four square kilometres), and was situated on the lower terrace of a single farm property (see Plate 4.9). The group's efforts were supported by the farm property-owner, on the proviso that their actions harmonised with his agricultural operations.

Between the mid-1990s and 2003, \$25,000 was spent by the group on improving spawning habitat in the Hague Stream, and included the extensive fencing of the stream's margins from stock (see Plate 4.10) and the shingling of the streambed to create redd sites (habitat where female salmon lay their eggs). Access to funds, provided through an annual salmon fishing competition in the Rakaia River (undertaken by a river promotion group of which the initiative is an off-shoot), paid

for the bulk of this work. The farmer also contributed funds (on a 50:50 basis) when he considered the group's activities to be of benefit to his farm operations (e.g., as in some cases of riparian fencing). Despite the extensive undertakings of the group, however, wild salmon spawning (i.e., that by naturally returning adult fish) did not significantly alter from pre-enhancement trends (see Figure 4.5).

The regional salmon management agency (i.e., the North Canterbury Fish and Game Council) has questioned the scientific merit of the group's work. In turn, the group tended to remain removed from close involvement with this organisation and other management agencies, such as the local water management authority Environment Canterbury. Underpinning this was frustration at the scientific arguments of the Fish and Game Council and a concern at what members regarded as the 'unnecessary bureaucracy' of such organisations, counter-opposed by a 'just get on with it' mentality amongst group members themselves.

Figure 4.5: Redds from wild spawning salmon, Hague Stream 1997 – 2001.

Note: The tendency to artificially stock the waterway from 2001 with adult salmon has made it impossible to differentiate wild and stocked salmon redds, therefore figures have not been included for years after 2001

4.2.6 Waimara Estuary Care group

Formed in 1995, Waimara Estuary Care was a voluntary organisation comprising ten core members. Underscoring participation was a shared concern about the physical condition of the Waimara Estuary and the valuing of the recreational, cultural and ecological values that it retained for members of the group. For this reason the group has been classified in this study as being social-oriented.

Group participants tended to be residents of the Waimara township itself or small landholders living nearby. Larger landholders, notably farmers, were not present in the core membership of the group at the time of this study.

The Waimara Estuary itself is a large, shallow water-body covering 165 hectares and is fed by two rivers, the Cole and Cobb (see Plate 4.11). The impacts of farming, especially dairying, are generally believed to be a significant contributor to contemporary ecological conditions and changes in the estuary (Environment Southland, 2003), with recent developments in the dairy industry intensifying these effects (Parkyn et al., 2002). The impacts of agriculture run-off, for example, are anticipated to have contributed to figures of microbial contaminants in the Estuary that were higher than acceptable for contact recreation (based on faecal coliform figures, see Table 4.3). These and other impacts (e.g., wetland development) have contributed to ecological effects that have run counter to the conditions that the group was seeking to improve in the Estuary.

Activities engaged in by the organisation included the purchase and on-going restoration of a flax wetland, an area of approximately three hectares on the Estuary's edge (see Plate 4.12), the promotion of urban storm water issues, riparian plantings and publicity events. Institutionally, the group was closely linked to Environment Southland (through its *Land Sustainability* section) and the New Zealand Landcare Trust.

Table 4.3: Peak faecal coliform counts (per 100 mls)* for the Waimara Estuary 1999 – 2002

	1996	1997	1998	1999	2000	2001	2002
February ⁺	540	1600	79	24	40	47	4800
July	79	35	7.8	38	20	100	7

* A medium level for faecal coliforms of 126 per 100 ml is specified as suitable for contact recreation by the Ministry for the Environment (2002).

⁺ February (dry) / July (wet) figures provide the opportunity to compare dry and wet periods of the year.

(Source: Environment Southland, 2003).

4.3 Summary

The preceding discussion has focused on the various contexts upon which this study is based. These include the biophysical and institutional environments in which CEM has occurred, and the underlying political, social and economic pressures that have shaped these. A point to emerge from this description is the recognition that CEM is not a new phenomenon in New Zealand, but has existed in various forms, including those that existed prior to the onset of European colonisation. The final part of this chapter has described details of the six case studies that are the focus of this inquiry. It is with these in mind that the next three chapters set out the findings from the investigation, based on the theoretical lenses and interpretative processes described in Chapter Three. It is to the first of these, social capital, that the next chapter turns.

Chapter Five:

Findings One: Social Capital and Community Environmental Management

Social capital, with its emphasis on trust and co-operation, is an attractive concept. After all, it holds out the possibility of developing voluntaristic solutions to problems that have not been solved through market mechanisms, government programmes or legislation (Bridger and Luloff, 2001, p. 467).

5.1 Introduction

Since the early 1990s, ideas associated with the concept of social capital have gained prominence in efforts to explain human collective behaviour (see Portes, 1998; Schuller et al., 2000). This has precipitated an interest in how the variables of social capital, including trust and social networks, can contribute to the development of initiatives that address environmental issues, including those that are community-based (e.g., Salamon et al., 1998). Within New Zealand, many policy makers have found the themes of social capital appealing, with strategies for social capital 'building' being presented as means for overcoming the problems created by the state's withdrawal from such areas as health care, education and the environment (see Easton, 1999; Richardson, 1998).

Despite the prominence of social capital as a policy variable, research into how it manifests itself *within* human collective arrangements, including those involving environmental concerns has been limited in New Zealand and overseas³¹. Instead, what has come to pass for analysis has focused on the assessment of initiatives against predetermined 'social capital' criteria (e.g., see Leach et al., 2002). This situation has contributed to a climate of uncertainty and unqualified claims about the forms social capital can take and the contribution it makes to the effectiveness of CEM groups. The inquiry of this chapter sought to redress this situation by exploring the form and influence of social capital across six case

³¹ Exceptions included Millar (2000), Nechodom (1998) and Sobels et al., (2001).

examples of CEM. From out of this process, four key arguments about the relationship between CEM and social capital emerge. These are paraphrased here as:

- *issues of meaning;*
- *matters arising from the relationship between social capital and other capital forms;*
- *the fungibility of social capital; and*
- *obstacles to the formation of social capital.*

In the subsequent reflections section (5.5), these arguments have been assessed for what they intimate about the form, function, performance and theory of CEM, four questions that lie at the centre of this study's objectives. An overall summary of these sections and how they relate to each other is presented in Figure 5.1. Before proceeding into the interpretative parts of this study, however, an introduction to the key themes within social capital theory is necessary and follows below.

Figure 5.1: Presentation of analysis - schematic

5.1.2 Social capital: Theoretical approaches

With origins in the classic sociology of Emile Durkheim (1897 [1951]), the theoretical work of Pierre Bourdieu (1985) and James Coleman (1990), and the applied studies of Robert Putnam et al. (1993), the concept of social capital focuses on how resources found in social relationships can assist in promoting collective action for mutual benefit. Interestingly, despite the numerous studies that have drawn on the concept, consensus on what is meant by social capital remains elusive. Rudd (2000) attributes this uncertainty to the existence of at least three different impressions of social capital, which he defines as the political, sociological and new institutional economic perspectives. In this study, the social capital approach adopted

was essentially a sociological one, and focused on how actor- and group-level forms of social capital come to facilitate collective action for mutual benefit (see Bourdieu, 1985; Coleman, 1988; 1990)³². A definition of social capital that summarises this perspective is one that describes it as: *those attributes found in social relationships such as trust, reciprocity, norms, rules and sanctions, and networks of civic engagement, which provide social cohesion and assist in mobilising people to act collectively for mutual benefit.*³³

Extending on this definition, the points below draw out the meaning and relevance of its key components:

- *trust* – the ability to rely on another person(s), thereby removing the need to monitor their behaviour (Pretty and Ward, 2001);
- *reciprocity* – socialised understanding that allows goods and services to be exchanged on the basis of social rather than financial transactions (Rudd, 2000);
- *norms, rules and sanctions* – social based customs and codes that provide confidence in the actions of others and the punishment of transgressors (Fine, 2001); and
- *networks of civic engagement* – linkages within and between groups that provide access to other resources (Portes, 1998).

Collectively, these attributes suggest that social capital is about particular social characteristics that interact to facilitate co-operation, through the confidence that other people will act in anticipated ways. I now move on from these definitional matters to observations on the forms and functions that social capital took within this study.

³² This perspective was chosen because it was amenable to the use of interpretative methods and is consistent with the phenomenological approach of this study.

³³ Elsewhere, prominent theorists have described the concept as follows: James Coleman (1988, S98) ‘... a variety of entities with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions – whether persons or corporate actors – within the structure’; Robert Putnam (1993b, p. 36) ‘... features of social organisation, such as networks, norms, and trust that facilitate co-ordination and co-operation for mutual benefit.’

5.2 The Presence of Social Capital within Examples of Community Environmental Management

5.2.1 Trust and reciprocity

As a variable, trust is considered by many to be both the 'glue' for, and 'lubricant' of, collective action (e.g., Fukuyama, 1995). It is argued to fulfil this role by reducing the transaction costs that on-going monitoring of human behaviour would otherwise be required. This, in turn, not only allows the rapid transfer of resources between actors – on the understanding that reciprocity will occur - but also liberates resources for use elsewhere (Pretty and Ward, 2000).

In this study, trust was observed to affect relations at the level of *intra-group* action and those centred on the exchange of goods and services *between* groups and *external* actors. At the intra-group level, trust manifested itself in the capacity of group leaders to act on behalf of their members without the need for constant consultation with them. Underpinning this was the belief that these actors would act in their best interests, with social norms and rules (see 5.2.3) helping to ensure that they did not transgress outside lines of accepted action. This trust aspect gave rise to three benefits to the groups in this study. These were: (a) it reduced transaction costs by decreasing the need for decision endorsement; (b) it allowed the bulk of a group's membership to remain free of bureaucratic tasks, thereby freeing-up time and other resources for work elsewhere; and (c) it allowed group leaders to respond quickly to different demands. An example of these trust functions emerges from an episode involving the Waitutu Abstractors Group.

In mid-2001, a proposal by Environment Canterbury to adjust the minimum flows of the waterways in the Waitutu area came to the attention of the executive of the Waitutu group. As these changes had the potential to impact on members' livelihoods (through changes in water availability for crops and pasture), this matter was of primary importance to the organisation's affiliates. Subsequently, without a formal directive from its membership, the chair presented a case on their behalf at several subsequent public meetings. In this episode, trust had two distinct parts. The first was the trust that the chairperson had that he was 'doing the right thing' on

behalf of the group. The second, was the assumed trust of the members that its executive would do what was best for their interests (Fieldwork, March 2000 - September 2002). Given the numerous demands faced by group members in running their farming operations, the benefits created by this trust function appear significant in terms of freeing up resources for other activities (e.g., time).

In terms of group / external exchanges, the trust relations observed in this study were visible in the formal arrangements for the transfer of goods and services. I describe this form of trust as 'institutional', and it was noteworthy for three features. Firstly, it was usually linked to official programmes, such as in the example of the Animal Health Board's Local Initiative Programme. Secondly, the trust / reciprocity relations were underpinned by the power of formal legal censure, whereby the failure to act appropriately upon the supply of goods and services could result in the imposition of regulations by the supplying authority. Finally, thirdly, institutional trust was susceptible to erosion by other institutional factors.

Drawing on examples to illustrate the qualities of this trust form, in the Waitutu study the CEM group received funding and technical support from Environment Canterbury, via its Resource Care programme. This programme sought to fulfil portions of this authority's land and water management policies (Environment Canterbury, 2003). Underscoring the supply of this support was the recognition, by group members and Environment Canterbury alike, that the failure of farmers to use these resources to manage their impacts on the environment could result in the use of regional rules to achieve this task (an outcome less normatively acceptable to farmers, see 5.2.3). Finally, despite the support and effort of Environment Canterbury staff to build a positive relationship with group members, other actions of the authority did, at times, undermine this relationship. The episode of the proposed changes to local waterway minimum flows, described earlier in this section, was one situation where this was observed to have occurred (for more discussion on this effect see 5.3.4).

While the capacity for reciprocity is frequently described as a benefit of community-based organisations (e.g., Buenavista, 1998), observations from this

study show there is a need to assess this capacity within the context of an organisation's membership. Observations from this research intimate, for example, that an inverse relationship arose between the complexity of a management task and the capacity of a group to meet its resource requirements through internal exchanges. Thus, when the resources needed were non-specialised, such as spades and trailers for riparian work-days (e.g., Kemp's Drain and Hague Stream initiatives), internal exchange patterns were able to accommodate these demands. However, as tasks were observed to become more complex, such as the trapping of ferrets in the Maine Valley, then these networks proved increasingly insufficient as suppliers of resources. This appears to have been because the skills, knowledge and equipment required to accompany such tasks typically did not reside amongst the membership of these groups. This is not a surprising observation, as the more specialised a task becomes the less likely it can be anticipated that members have been involved with it in the past or own equipment related to it; a point that emerges as correct from this investigation. The role of networks, explored below, provides further insights into the intricacies of these exchange relationships.

5.2.2 Networks

Within the research accounts describing social capital, networks are usually prescribed the function of linking groups to sources of goods and services (Portes, 1998). Scott (1991) argues that networks are highly variable, some being long established while others are susceptible to regular change. Studies of CEM network relations, specifically, have emphasised the importance of networks as pathways for the transfer of knowledge and as mechanisms encouraging collaborative behaviour (Leach and Pelkey, 2001; Millar 2000; Preister and Kent, 1997). In this research, two prominent network relationships were observed. They were: (a) internal networks existing within a CEM group; and (b) networks between CEM groups and external actors and organisations. Each of these networks had its own characteristics and needs to be considered separately.

The *internal* network arrangements were characterised by the following features. Firstly, relationships tended to be horizontal in nature; by this, I mean they involved exchanges in which participants tended to share equal levels of power and

control. Secondly, these networks were often grounded in relations that had origins outside of participation in a CEM group. Thirdly, these networks were usually informal in nature, with the likes of word-of-mouth exchanges being a common medium of exchange, a quality summarised in an informant's comment below:

Farmers do talk over the back fence and at social engagements. You know someone will say 'so and so is on movement control' or 'how many ferrets have you got?' or 'I ran over one on the way here', and suddenly it goes off on a tangent onto something to do with vector control (Member, Maine Valley, July 2001).

Fourthly, these networks tended to be strengthened by regular interactions, including those outside of the CEM group itself. In rural areas, such as Barry's Stream, Maine Valley and Waitutu, for example, interaction through local school events emerged as significant over the course of this study. The observation is supported by the comments of a Waitutu group member, reproduced below:

The biggest social group that I have been associated with in this area is the school and when the children went to school there was a lot of social interaction with other parents . . . when the children leave school you are cut off from the other people (Member, Waitutu, October 2001).

In the situations where members were not physically based in the spatial environments that they were seeking to manage, as in the Kemp's Drain and Hague Stream cases, alternatives to the 'exchange' situations described above did exist. In the Kemp's Drain case, for example, shared membership of a local anglers club provided an alternative forum for interaction. However, for these groups, the density of interactions – that is the number of opportunities people had to interact with each other – were reduced by the lack of physical proximity to each other. This had the effect, I believe, of reducing the strength of the intra-group relationships between members of these two groups.

Given the previous observations of the resource limits within groups, it is not surprising that linkages between groups and outside bodies performed a key role in the functioning of the former. Fundamental here was the goods and services that the likes of Environment Canterbury, Environment Southland and the Animal Health Board were able to provide to the CEM organisations they were associated with. These typically involved goods and services that were *not* available within the

membership of a CEM group (e.g., knowledge of, and equipment for, ferret trapping). Access to these resources subsequently allowed members to focus on the immediate tasks of environmental management, such as ferret trapping or planting riparian vegetation, instead of having to expend energy accessing these.

The importance of such network relations can be assessed by comparing the histories of the Kemp's Drain and Waimara case studies. In the case of Kemp's Drain, the timing of this initiative (early 1990s) coincided within an institutional environment that was not generally supportive of CEM compared to that of the latter 1990s (the environment within which the other five groups have functioned). This point was noted, on reflection, by the group's ex-president:

It was kind of a new concept at the time; relatively new . . . and most of the initiatives before that had probably come from the organisations themselves, the statutory bodies (Member, Kemp's Drain, June 2001).

An effect of this was that the members of the Kemp's Drain group were required, more so than the others in this study, to divert their energies from restoration activities to those that secured funding and other goods and services. A number of informants I interviewed indicated that this demand had reduced their enthusiasm for the project, as it had taken them away from what was considered the more immediate (and desirable) tasks of 'helping trout' (e.g., by physically planting shrubs). The Waimara group, by contrast, has evolved within an institutional environment offering opportunities not available to the Kemp's Drain group. This has included sources of funding that have allowed the organisation to undertake a range of activities, including the purchase and partial restoration of a flax wetland. This has occurred with a reduced need for members to divert their efforts to tasks such as fund raising, which is removed from the immediate activities of estuary enhancement. The opportunities created by this situation were described to me by one of the group's members:

I think that perhaps if we tried to do this twenty years ago other organisations would not have been up to speed and we may not have had the recognition or the funding . . . that's come together so well now (Member, Waimara, November 2001).

Comparing the external networks with the internal ones, two key points emerge. The first is that the former are vertical and hierarchical in character, because of the dominant position of the external authorities in the exchange relationships. Secondly, they were transparent and formal in nature. What I mean by these two points is highlighted by the example of the Animal Health Board, its Local Initiative Programme and the Maine Valley group. Within the arrangement between the Board and the group, the former has been dominant by virtue of its statutory authority under the Biosecurity Act (1993). The transfer of resources down to the group, meanwhile, has occurred through a formal process instigated and managed by the Board (Animal Health Board, 2001a). This process has also been transparent, as the exchange of goods and services between the two bodies has been documented carefully through official accounting procedures.

In summary, external networks emerge from this study as a prominent attribute contributing to the operation of five of the CEM organisations in this project, primarily through the access they provided to different resources, such as finance, knowledge and experience. The importance of these networks was described to me by a Waimara member, who stated:

... networks are everything for us. If it was just the core group it would still function but we wouldn't get anything like the amount of work done that we have. It is our networks that have moved us forward and kept us stable (Member, Waimara, November 2001).

The Kemp's Drain initiative, in contrast, suffered constraints on its activities due to limited external network relation opportunities at the time it was operating. Therefore, this group faced the on-going problem of securing sufficient resources to fulfil its intended objectives, while simultaneously seeing the energy of its members spent on activities not immediately associated with management of the Drain's physical environment.

5.2.3 Norms, rules and sanctions

Norms and rules comprise mutually agreed conventions of social conduct that see wider group interests placed above those of the individual (Fine, 2001). More specifically, Pretty and Ward (2001) describes norms as the preferences of how an

individual should act, while rules comprise the stipulations of what behaviour is considered acceptable. Together, these attributes permit groups to establish and maintain a stable social order, which in turn creates a predictable environment for social action, where actors are conscious of the acceptance (or not) of their behaviour (Fine, 2001). The potential for sanction, meanwhile, ensures that those who wittingly or unwittingly transgress group norms and rules face the possibility of social censure (Schuller et al., 2000).

In this research, norms, rules and sanctions were observed to interact in various ways to affect the operation and achievements of the six CEM groups³⁴. Starting at a general level, norms and rules served to provide guides and boundaries for collective action, although the degrees to which they performed this function varied across the initiatives. To illustrate this, it is useful to draw on comparisons between the two dominant group types – productive and social. Amongst the productive-oriented groups, a clear set of generalised norms and rules were discerned to reside across the relations between the members involved in the CEM groups³⁵. The first norm was the understanding that they and their fellow group members should be given a ‘fair go’ in their interactions with each other and the physical environment. This translated itself, as in the Waitutu and Barry’s Stream studies, into the theme that there should be equitable access to water between members and that this should be free of outside controls (e.g., regulation). Complementing these norms were two social rules. They were: (a) that a landholder should be free to use the resources on their property without external interference; and as a caveat on this rule, (b) as long as a person’s activities did not adversely affect the livelihoods of their neighbours. The qualities and themes underscoring these norms and rules are reflected in the comments of a farmer I interviewed from the Barry’s Stream Care group:

Your farm’s your farm, it’s one of the attractions of farming, you are your own boss and you are kind of reluctant to have someone else come in and tell you what to do, there is no doubt about that (Member, Barry’s Stream, December 2002).

³⁴ Because of the issues of space and relevance I have chosen to not explain the origins of the norms and rules observed in this study. For a detailed exploration of this subject Fine (2001) is recommended.

³⁵ The fact that almost all of these actors were farmers and subject to similar social, economic and political forces offers an explanation as to why these generalisations can be made.

Amongst the productive-oriented groups, these norms and rules interacted to *assist* and *detract* from their effectiveness as environmental management institutions. Amongst Waitutu group members, for example, there was social pressure – grounded in the norms and rules described here – that they should comply with regional council controls on water abstraction and the group's wish that local water permit holders should undertake waterway restoration work. Underscoring this was the appreciation that actions contrary to this could result in the council invoking greater controls and constraints on water abstraction. One informant, reflecting on an episode that arose when one member indicated that he would irrigate illegally, illustrated the power of these norms and rules within the social contexts of a CEM initiative in his comments. The episode is recounted here in the informant's own words:

His comment was 'well, I will run it at night, but the group said 'no!' And away he went in a flaming shitty . . . we felt miserable, but the group said 'no, to hell with him, we have worked hard for this and he is not going to stuff it for us'. . and that was probably something that built up over the last few years. Perhaps the first year we might have said 'ok' . . . but now people realise . . . we need the group to continue and so they are not prepared to risk it (Member, Waitutu group, August 2001).

In contrast, the capacity of the productive-oriented norms and rules I have described to *detract* from the effectiveness of a group was demonstrated in several episodes recounted in my fieldwork, one of which is described here. In this case, involving activities in the Maine Valley, it became apparent that the rule whereby it is not acceptable to tell a farmer what they may and may not do on their property permitted certain behaviour to go socially uncensored in the Valley. This was despite the fact that the activity was known and appreciated as detrimental to the objectives of controlling bTB. The activity itself involved one farmer (also a group member), running a 'farm safari' operation, who because of the hunting value of any wild pigs or deer that migrated onto his property, allowed these animals to reside there unchecked. The physical problems created by the presence of these animals was summarised to me by a Board employee, who stated:

. . . and we have got several properties in the Maine Valley district that quite concern me at the moment in that they are actually protecting - if you like - some feral vectors that may be the architects of their own problem. So there

are some issues there and to date peer pressure, which we have been trying to apply with some of them, hasn't been working too well to be honest (Environment Canterbury employee, Maine Valley, August 2001).

The fact this behaviour was allowed to continue could be attributed to the presence of the norms and rules I have described. Their influence has, to this point in time, allowed this farmer's actions to continue without social sanctions being incurred. This helps to account for why 'peer pressure' has not worked thus far in curbing this behaviour, a point queried in the above comment of the Council employee.

In contrast to the norms and rules present in the productive-oriented groups, it was difficult to discern a transparent set of these across the socially-oriented initiatives. The one norm that did appear to be shared was centred on the enthusiasm for being involved in something that allowed participants to 'help the environment'. This norm is highlighted in the following series of quotes from the members in these groups:

We have the same interest as what I have (sic), trying to look after nature (Member, Waimara Group, November 2001).

I don't know, satisfaction I suppose. Nothing financial. Yeah I don't know. Just a sense of bloody doing something right I suppose, doing something! (Member, Hague Stream Group, describing his reasons for involvement in its initiative, October 2001).

Me: *What relationship did you share with other participants?"*

Informant: *"Hmm . . . maybe a passion for putting something back into the fishery and into, maybe, the restoration of ecology* (Member, Kemp's Drain Group, October 2001).

Moving on, the next section draws on aspects of the preceding 'rich' description and synthesises them into a set of interpretative arguments. The purpose of these arguments is to enhance our understanding of the relationship between social capital and CEM.

5.3 Synthesis and Analysis

Working from an emergent perspective, four primary arguments emanate from the preceding observations about the relationship between social capital and CEM. I have paraphrased these arguments as: (a) issues of meaning; (b) the relationship of social capital to other capital forms; (c) the fungibility of social

capital; and (d) obstacles to the 'building' of social capital. The inspection of these arguments follows in the sub-sections below.

5.3.1 The issue of meaning

The observations on trust, reciprocity and norms from my case study work highlight the influence that empathy and mutual understanding have on collective action, extending from the management of bTB to the restoration of stream margins. In seeking to understand the source of this, Fine (2001) suggests it is useful to study the importance of social meanings. Meanings are the interpretations that people give to 'things', and which are created and recreated through social processes (Abercrombie et al., 1984). Several theoretical approaches explore how meanings are formed and affect human behaviour (e.g., symbolic interactionism and interpretative anthropology). A perspective that emerges as both useful and reflective of the processes observed in this study is that of ethnomethodology (Garfinkel, 1963; 1967). Ethnomethodology, a school of sociological theory founded by Harold Garfinkel, focuses on the question of how people come to make sense of the world around them (Heritage, 1984). As a theoretical approach, it is particularly relevant to the insights in this chapter because it recognises *trust* as a central variable.

Drawing on Alfred Schutz's concept of the 'reciprocity of perspectives', Garfinkel (1967) argues that trust develops between people because of the belief they have that those with whom they interact see the 'world' as they do; in other words, they ascribe the same meaning to social phenomena (Heritage, 1998). Trust, in this sense, is a product of cognition - that is an actor-centred process people engage in to interpret, and through this make sense of, the world around them (Heritage, 1984)³⁶. Garfinkel's notion of trust provides a frame for organising the observations from the previous section into a coherent argument that can account for human collective action. Using it, one can attribute the decision by a Maine Valley farmer to participate in vector management, partially at least, to the meaning-based trust they

³⁶ Unlike other meaning-centred theoretical perspectives, ethnomethodology refrains from exploring how meanings are transformed through processes of social negotiation. Instead, it steps back from such meso level topics (Maine, 1983) and explores meaning development at the micro-level of the individual (Heritage, 1984; 1998).

have that their neighbours see ferrets and possums 'as they do'. Further, this translates in to a belief that these actors share the wish to control them. This appreciation provides a link between trust and reciprocity, with reciprocity arising because of people's trust and therefore willingness to exchange resources to achieve outcomes consistent with a shared meaning (see Fine, 2001).

The ethnomethodological perspective can also assist in understanding why the members of some groups have come to regard other actors with suspicion, and have sought to distance themselves from involvement with them (a network issue). A case-in-point has been the efforts by members of the Barry's Stream group to keep non-residents, such as anglers, apart from the decision-making apparatus of their organisation. From the argument presented here, this tendency can be understood as emerging from an appreciation that these persons do not see the world as they, the members of the group do, and therefore must be regarded with suspicion. One member of this group summarised this appreciation in the following terms:

... if we have someone who has got other than land interests in the group, then the chances of getting that degree of openness and honesty are bloody remote (Member, Barry's Stream, September 2001).

Drawing these points together, one can conclude that patterns of shared meanings provide symbols around which trust develops and strategies of collective action are organised. People are subsequently willing or unwilling to engage in exchanges depending on the trust they have that others see and will act towards the world as they choose to.

5.3.2 Social capital and access to goods and services

The way social capital functions to generate mutual benefits is a primary question, especially the way its attributes conspire to provide access to goods and services. For example state authorities, such as Environment Canterbury and the Animal Health Board, have sought to mobilise the physical and human resources that reside at the community level to achieve certain biophysical ends. To do this, they have drawn on network linkages as a means for accessing these. The use of networks in this way was aptly summarised for me by an Environment Canterbury employee, working with the Waitutu Abstractors Group, who stated:

In any community there are centres of influence, I always attempt to try and work with these people . . . so we are able to use the existing networks and to bring them together and create extensions to them, with a bit of luck (Resource Care employee, Environment Canterbury, Waitutu, June 2001).

In a corresponding fashion, the CEM groups themselves have drawn on linkages with agencies to gain access to the resources they retain (e.g., through grants and subsidies for environmental work). This, in turn, has provided a further rationale for the participation of some individuals in their local CEM groups, a point highlighted to me by a Maine Valley participant (below):

Me: *So why is this farm involved in the LIP initiative?*

Participant: *Because it makes sense to. It's a local initiative and by banding together in the programme you get information and money to assist you (July 2001).*

Similarly, members of the Waitutu Abstractors Group found that external and internal network linkages provided them with access to the skills and information necessary to renew their water rights. In the Waimara study, meanwhile, access to the financial capital of the World Wide Fund for Nature permitted this group to purchase land for the restoration of a wetland remnant. Therefore, from these observations it appears that networks, and the trust and reciprocity that append to them, are important for the access they provide to numerous goods and services *within* and *outside* of a CEM organisation.

Observations from this research also suggest, however, that the resources that become available through these linkages are highly variable in terms of their utility value. Furthermore, linkages to external bodies (i.e., those beyond a group) appear especially valuable in terms of the range of resources they provide access to. To appreciate this situation, it is useful to re-visit the seminal work of Granovetter (1973) on 'strong' and 'weak' ties. Based on a study of white-collar job search histories, Granovetter (1973) identified weak tie linkages, that is those involving people and groups *outside* of a person's regular zone of contact, as the most likely to facilitate recruitment success. This contrasted to strong ties, where regular contact was the defining feature. Granovetter (1973) identified the root of this as being the

fact that strong ties tended to replicate network possibilities, whereas weak ties opened up a range of new opportunities beyond these.

Granovetter's (1973) ideas can offer a framework for understanding the comparative efficacy of the network processes described on the previous page, as they highlight the limitations that can arise for a CEM group that chooses, or is obliged to draw largely on, internal (strong) ties for its resource needs. In these situations, the tendency will be for these linkages, as Granovetter's (1973) thesis suggests, to replicate the range of resources available to a group rather than to open up access to new forms. This can affect the capacity of a group to be effective by limiting the range of knowledge, skills and goods that it has access to. This effect can be used to account for some of the resourcing difficulties faced by the Kemp's Drain group. In its case, I have described how limited linkage to outside networks was a feature of its operational history. Drawing on Granovetter's (1973) argument, it can be appreciated how this situation created restrictions to the resources that it was able to obtain access to. Because of this, it appears that external linkages (Granovetter's 'weak ties') are particularly important to the functioning of the groups in this study, because they facilitate access to resources that are otherwise absent from within internal, strong tie networks. This provides some vindication for the support strategies undertaken by the agencies I have described working with these organisations (e.g., the Animal Health Board's Local Initiative Programme).

5.3.3 The fungibility of social capital

In their examinations of social capital, Portes (1998), Portes and Landolt (1996) and Coleman (1990) have respectively explored the relationship between social capital and its outcomes. All three challenge the arguments of Putnam (1995a, 1995b) that social capital is a purely positive variable for society, suggesting instead that it needs to be considered a neutral element that can be good, bad or indifferent for collective action, depending on a situation *and* perspective. Coleman describes this property as the '*fungibility*' of social capital (1990, p.302), while Portes and Landolt use the term 'down side' to describe the negative effects that social capital can have on some collective situations (1996, p. 18-21).

The fungibility of social capital is a theme echoed in various episodes observed in this study, and which together demonstrate the opportunities and difficulties that the concept heralds for collective action. The previous described episode involving norms and rules in the Maine Valley and the subject of feral deer and pigs on one member's property, is an apt example of how social capital can function to frustrate the accomplishment of desirable patterns of collective behaviour. In this episode, local norms and rules conspired to legitimise modes of behaviour at odds with the physical objectives of the Maine Valley group. On a positive note, meanwhile, they also ensured that farmers with cattle and deer felt socially compelled to participate in the Valley's vector control programme; this is despite the opportunity to free ride on the efforts of others.

Elsewhere, observations on the network-functions in this study identified numerous ways that these can impact positively and negatively on the operation of a CEM arrangement. Tight networks, as in the case of the Barry's Stream group, have conspired to produce the aforementioned group policy that external actor groups should be excluded from its activities. While this has allowed the members of the Barry's Stream group to retain a degree of its traditional control over local resources and to be open in their group exchanges, it has meant that a number of stakeholders have been deprived of a voice in this organisation. This is despite the observation that this group has, by *de facto*, become the lead management agency for the waterway. It has concurrently, in addition, denied access to the resources that these other actors could have provided to the initiative.

Another instance of how social capital can skew the CEM process emerged from a trust function described earlier in this chapter. As I previously described, group members across the six studies displayed a willingness to cede responsibility to certain individuals; an outcome, I suggest, based on trust. One repercussion of this practice was that it was discerned to provide the 'trusted' individuals with the opportunity to steer the activities of their groups in directions of their choosing, as long as they stayed within the broad social bounds of the group. In the case of the Waimara group, for example, this was demonstrated by the way one of its prominent members had influenced the direction of the organisation's wetland restoration

project, so that it reflected his personal interest in amphibians. This situation was recounted to me by this person himself, who stated:

My real thing is ponds, frogs and amphibians. That's my deep core thing . . . and partly that is why we are developing this freshwater pond on the reserve. There is no real need for it, however I see the opportunity there for a froggy environment (Member, Waitutu, November 2001).

In a similar fashion, a prominent reason in accounting for the focus of the Trout Unlimited group on Kemp's Drain was its president's personal interest in this waterway.

These two examples raise questions about the overall representativeness of the decision-making processes in these two respective groups. What I discerned from the above examples was that neither of the described projects was a product of democratic decision-making. Instead, they were proceeded with because of the influence of these two actors, the trust in them and the consistency of the projects with the 'do something in the environment' norm I previously described as a social-oriented group feature. The implications of this process are not necessarily minor in terms of the operation of a group. Returning to the Kemp's Drain study, comments from informants indicated that a lack of common interest in the waterway amongst participants and the wider angling community, was a contributor to low membership numbers. This not only meant that the group did not obtain access to the human and financial resources additional members could have brought to it, but it also increased the responsibility placed on those in the group to find the goods and services necessary to accomplish its tasks. Nonetheless, despite this situation, the participants I interviewed across the six CEM organisations tended to not regard the influence of these 'trusted' actors as a negative quality. Instead, any concerns over the influence of these people appear to have been out-weighed by the value placed on their enthusiasm and dedication.

Bringing the points explored here together, the processes described in this section support an appreciation of social capital where it's negative and positive contributions to CEM are noted. By recognising both sides of the contribution, it provides a better basis for understanding how social capital can be managed to

accomplish the outcomes desired from CEM. This is because scholars and practitioners alike will be attuned to the different implications of social capital on collective human action. By contrast, if society chooses to rely on normative notions of social capital, then the nuances and intricacies that emerge from this study will not emerge because of the elements that are overlooked within these images. The consequence could be outcomes that complicate and undermine the social capital / CEM relationship, but go unrecognised. Other qualities that can contribute to such a situation are explored in the next section.

5.3.4 Obstacles to the formation of social capital

While this study has revealed processes that assist in the formation and contribution social capital can make to collective action, it has also identified a set of factors that detract from this. The form and origins of these are the focus of this section. Firstly, amongst the productive groups, the building of trust and networks with external actors and organisations was complicated by the problem of *issue loading*. Issue loading arises in situations where interactions between actors and organisations are disrupted by past disputes, which bring forward frustration and unresolved conflicts into present-day relationships (Preister & Kent, 1997). Issue loading arose as a problem, for example, in the internal-external relations between the Animal Health Board and the Maine Valley group, Environment Canterbury and the Barry's Stream and Waitutu groups, and the North Canterbury Fish and Game Council and the Hague Stream group.

Drawing on the Maine Valley and Hague Stream cases as examples, the development of trust between the Board and this group was burdened by dissatisfaction at the way that the state had handled pest management in North Canterbury (the Board, in this context, being considered as synonymous with the state). In particular, there was a feeling amongst members that with the passing of pest destruction boards, the state had set in train events that had paved the way for the present day vector problems in the Valley. In the Hague Stream case, meanwhile,

scare stories³⁷ were invoked by informants from the group to emphasise the incompetence of the North Canterbury Fish and Game Council and to account for why it could not be trusted to act effectively in support of habitat restoration. On reflection, however, the process of issue loading did not appear to prevent network relations developing between the groups and outside authorities in this study. However, it did temper the level of trust (other than institutional) in these relations, a situation made even more complicated by the obstacle described in the next point.

At the heart of the second obstacle lies the issue of the multiple roles that authorities (e.g., Animal Health Board and Environment Canterbury) occupy as both facilitators of CEM, and as enforcement and planning agencies. In the former role, these organisations have provided assistance to the likes of the Maine Valley, Barry's Stream and Waitutu groups. In the latter, they have undertaken duties that, at times, have conflicted with the development of these relationships. One episode illustrating this problem involved an incident in which the enforcement wing of Environment Canterbury proceeded with legal action against a member of the Waitutu group, for the illegal cultivation of a salt marsh wetland. This had the subsequent effect of destroying some of the trust that the Resource Care section (of Environment Canterbury) had developed with this group. The effects of this on the relations between these two bodies were described to me by a member of this unit:

So that generated a lot of tension between the group and this organisation and that, probably, is still a barrier that we still have to work at (Resource Care employee, Environment Canterbury, Barry's Stream, June 2001).

What becomes apparent in this example, is that the multiple responsibilities of this authority gave rise to a situation where the performance of certain duties generated adverse impacts on the capacity to sustain social capital relations (e.g., trust). In comparison, I noted that organisations without these alternative tasks, and which were exclusively focused on assisting CEM groups, did not face these potentially contradictory situations. The New Zealand Landcare Trust is an example of an

³⁷ A term taken from McHenry (1998) and used to describe examples of stories that people draw on to describe an undesirable element in another person, group or thing. The person invoking it can use these stories to legitimise a line of action. Scare stories can take on the characteristics of an urban legend, wherein the origins and the reliability of the story become increasingly unclear through time and repetition.

organisation operating within such parameters, although its linkage to groups in this project was restricted to the Waimara example (see Towle, 2002).

The third factor complicating the development of social capital arose from aspects of the operational responsibilities and protocols of the authorities assisting the six CEM groups. Of importance here were certain formal and bureaucratic procedures that these authorities were obliged to follow in their exchanges with these groups. In several cases, these generated difficulties that, in retrospect, the authorities could do little to circumvent. An example comes from the relationship between the North Canterbury Fish and Game Council and the Hague Stream group (Fieldwork, November 2001). In the late 1990s, a council officer visited the stream with members of the group to see how the two parties could complement each other in the latter's restoration efforts. Following the visit, the staff member was compelled to point out several areas where formal permission, in the form of resource consents, would be required to do some of the activities the group planned to undertake. This advice was not well received by group members, who felt that the representative's recommendations were officious and unnecessary. For example, in recounting this event one member's views were:

[He] put a whole lot of red tape in front of us and we sort of thought 'well, if we go that way we have got another two years before we can do anything' . . . we sort of took the bull by the horns and dealt to it (October 2001).

The subsequent actions of the group, where it undertook a number of activities *without* official approval created a situation that was untenable for the Council, in terms of its legal statutory position. From the group's perspective, meanwhile, the actions of the Council, in distancing itself from the initiative, were considered to represent its over bureaucratic and unhelpful character. Similar tensions have underpinned the relationship between the Animal Health Board and the Maine Valley group, with the latter party being frustrated at the former's failure to give higher regard to the role of the ferret as a bTB vector. Again, as for the case involving the Fish and Game Council, the Board has been faced with the task of acting within certain protocols that have perpetuated this situation. A Board employee highlighted, for example, the difficult position occupied by it in regards to officially recognising the ferret's role as a bTB vector:

Employee: *And you know basically the Board, dealing with public money, not just Crown money but public money, couldn't do anything unless it had some very strong evidence . . . it couldn't just on a whim say 'ferrets were'.*

Me: *So it is public accountability?*

Employee: *Absolutely! And part of the accountability was gazetting it and to gazette it you have got to go through a process and so on (August 2001).*

These contrasting expectations and organisation conditions highlight the complexities that can arise in the applied world of network relations. Moving on from these arguments, the next section offers a set of reflections that are organised around a re-visiting of the objectives of this study, drawing on the insights iterated in this chapter.

5.4 Chapter Insights: Re-visiting the objectives of this study

In revisiting the objectives of this study, it is necessary to review what the insights from this chapter's analysis suggest about the form, function, performance and theory of CEM. The initial focus, in the first of the proceeding sub-sections, is on the form and function of CEM.

5.4.1 Form and function of community environmental management

Farmers who are involved in a similar situation themselves are more likely to listen to opinions that come through the group, rather than having a direct approach by the regional or district councils (Member, Barry's Stream, August 2001).

The above statement, from a farmer and member of the Barry's Stream Care group, captures the essence of what the social capital lens suggests about the form and function of CEM. This is, in summary, an understanding that aspects of social relations - such as trust and reciprocity - can beget desirable patterns of collective behaviour. In prompting this image, the themes of social capital re-organise the questions that managers must ask of environmental situations. Thus, whereas under the traditional frame of 'command-and-control' the question asked has included 'how do we get farmers to remove their stock from waterways?' under a social capital frame this question becomes, 'how can we use local social relations to protect stream water quality?'

As a way of conceptualising CEM, the above themes steer us towards a functional image of the concept. Within this, the focus falls on the role of CEM institutions as loci for the mobilisation and direction of social capital towards patterns of acceptable collective action. Findings from this project indicate there are two ways this can be contributed to by social capital. The first is the access social capital variables (e.g., trust and networks) can provide to goods and services that help to accomplish these ends. The second is how these variables, particularly social norms and rules, can encourage actors to undertake actions that either benefit *or* hinder the goals of a group.

One needs, however, to be wary of the value ascribed to social capital as an agent for promoting CEM. As the inquiry here, and the observations of others have discerned (e.g., Portes, 1998), there is nothing inherent within social capital that ensures collective, environmentally beneficial, behaviour present in it. The observations of how the interaction of certain norms and social rules in Maine Valley have allowed farm practices not conducive to bTB control to continue are illustrative of this (see Section 5.3.4). From such an episode, one becomes aware of how elements of social capital can 'lock' actors into collective action patterns at odds with the environment goals they are pursuing.

Given the above findings, the challenge for those working within and with groups is how to manage social relations so as to get the outcomes they seek. The need to address this question indicates that the presence of social capital is not enough for ensuring the operational effectiveness of CEM. Concurrently, there is also a need for methods that can steer the elements of social capital in the direction sought by those who draw on it as a management tool. In the next chapter, I describe one such method, premised on the notion of 'enrolment', from actor network theory (see Section 6.3). Other questions that practitioners need to also ask of the CEM - social capital relationship are: (a) what aspects of social capital already reside within a group and what are their strengths?; (b) what can we add to a social setting to further the opportunities for desired patterns of collective action?; and (c) how can

we manage those aspects of social capital that detract from the collective action that we wish to encourage?

The points raised in this chapter's inquiry also prompt a need to reconsider the notion of community that appends to the CEM concept. What these insights suggest is a narrower image of community from traditional notions of the term (see Thompson, 1971). In a *social capital* sense, community becomes a term that describes those actors who share a set of defined social relations based on such attributes as trust and norms, which inspire certain patterns of collaborative behaviour. Observations from this study indicate that there are two dimensions to this notion of community. The first is based on intra-group relations where, for example, trust and norms and social rules are especially important. The second is those that involve inter-group co-operation (e.g., Environment Canterbury and the Waitutu Abstractors Group), with the focus here falling on the role of particular network relations. Within the social capital literature it is the former, that is the intra-group relations, which have usually received the most critical attention (e.g., Putnam, 1995). However, insights from this study on the dilemma of resource limitations within 'strong tie' social relationships, indicate that the latter are equally important to advancing the effectiveness of CEM.

Underscoring the points I have raised here is the appreciation that context is important to the form and function social capital occupies in different collective action situations. For example, as shown by the contrasting experiences of the Kemp's Drain and Waimara Estuary Care groups, temporal aspects have played a key role in the relative capacity of each to access goods and services through external network linkages. Given this, the recognition of contextual differences (time and space) appears necessary for those exploring how social capital can facilitate CEM. Because of this, blanket pronouncements of social capital 'construction' appear ill suited as foundations for CEM capacity building (e.g., Kerr, 2000). What seems necessary, instead, are approaches that draw out the social capital dynamics of each situation where a group is operating and considers what is best - in this context - for advancing the activities of an initiative. The way that the Resource Care section of Environment Canterbury has evolved methods to assist some of the groups it works

with suggests that elements of this approach arise in its work, with the following statement from an employee capturing this tendency:

A lot of it is actually networking the groups with other people who can help. So if a particular problem comes up, we will try and network them with a research organisation or another farmer group (Resource Care employee, Environment Canterbury, Barry's Stream, August 2000).

5.4.2 Group performance: A social capital appraisal of effectiveness

The question of whether the groups in this study have performed effectively from a social capital perspective necessitates, firstly, an understanding of what 'effectiveness' means from this theoretical perspective. Insights from the preceding sections intimate that there are two parts to this question. The first is inspired by the need to consider how the variables of social capital (e.g., trust and networks) conspire to encourage people to *combine* to act collectively towards the environment. The second part involves understanding how these variables *interact* to facilitate the objectives that different actors set for a CEM initiative. Reflecting on this latter point requires an appreciation of viewpoint, as the assessment of how social capital proceeds to enable different activities will depend on an actor's perspective. In the ensuing treatment, I have taken the perspective of the group members as the vantage point for this assessment. Drawing on the themes from the preceding sections, the information summarised in Table 5.1 highlights the prominent qualities of social capital that emerge from this study of CEM. Of note in this table is the need to differentiate between intra- and inter-group processes (vertical axis) and the necessity of considering the contributions of social capital from both a positive and negative perspective (horizontal axis). A more detailed assessment of the contents on the table is set out in the two sub-sections that follow.

a. The productive-oriented groups

Starting with the contribution of trust, observations from this research indicate that for all three of the productive-oriented groups there were sufficient levels of internal trust to facilitate and maintain the operation of their respective CEM groups. The key factors here were the ethnomethodological processes, described earlier, premised around members' common productive relationships with

Table 5.1: Aspects of the relationship between social capital and community environmental management - case study insights

Levels		Nature	Positive Contributions	Negative Contributions
Trust	Intra -group	Informal. Grounded in social relations centred on meaning	Frees up resources by removing need to monitor others behaviour and the need to seek approval from all members for courses of action	Can encourage decision-making processes that are not reflective of collective input
	Inter-group ¹	Formal. Grounded in institutional relations. Not so important as a glue for collective action (as above)	Anticipation that supply of goods and services will see certain patterns of action occur	Vulnerable to erosion by activities and events outside the immediate relationship of groups and organisations
Reciprocity	Intra-group	Informal exchange of goods and services within groups. Predominantly one-to-one	Provides access to non-specialist goods and services	Limited access to specialist goods and services
	Inter-group	Predominantly formal exchange of goods and services down to groups from external parties	Provides access to specialist goods and services	Goods and services may not match up to wants of groups
Networks	Intra-group	Horizontal. Grounded in social relations	Provides linkages of intra-group reciprocity of goods and services	Capacity for networks to benefit collective action limited by resources that reside within internal group membership
	Inter-group	Vertical. Grounded in institutional relations	Provides linkages for downward movement of goods and services from external agencies	Extra-network events and activities such as <i>issue loading</i> can reduce effectiveness of networks
Norms, rules and sanctions	Intra-group	Different group types have varying norms and rules that impact on collective action	Supply informal compliance for activities that benefit collective activities of groups	May sanction behaviour that is counter to the objectives of a group
	Inter-group	Internal group norms and rules can impact on external relationships	Can encourage complicity with the strategies of external management agencies	May prevent peer pressure being invoked against certain activities

¹ The inter-group relationships referred to here involve those between the groups and, primarily, state authorities (e.g., Environment Canterbury and its relationship with the Waitutu Abstractors Group).

their local physical environments. The orientation of these meanings was obviously different between the three groups. In the Waitutu study, for instance, they were centred on the importance of water and the ability of the individual members to access it from local streams for irrigation purposes. In the Maine Valley case, they were premised on the meanings of bTB infection for cattle and deer producers, while for the Barry's Stream study they were less specific, but were influenced by a wish to maintain control over local resources (Fieldwork, March 2000 - September 2002). Within these three groups, the shared nature of these meanings contributed to the capacity for reciprocity that was remarked on earlier (see 5.3.1). This variable was an important element in encouraging people to enter into CEM activities, and further, to engage in processes of exchange. Historic resource dilemmas, such as water shortage in the Waitutu group's case and the appearance of bTB amongst local cattle and deer herds in Maine Valley, were key incidences in galvanising this trust and encouraging its transformation into patterns of collective action. The comparative role of these events is reflected in the informant comments transcribed below:

When it first began [the group] people didn't realise the reality of what happened when your water gets closed down, and when it finally did and we didn't get rain and people's farms started to burn-up and the reality sunk in, and that's just an effect that made it stronger [the group], as it would (Member, Waitutu group, August 2001).

If there is a bovine TB incident in the area that really motivates these guys, they will actually work together (Animal Health Board employee, Maine Valley, August 2001).

Besides providing a basis for connection and exchange, trust contributed to the aforementioned tendency of members to place faith in their group leaders, a factor noted here as an attribute of all three groups.

Underpinning the influence of trust on group formation and maintenance was the influence of norms and rules (described in 5.2.3). These have tended, as noted, to have a dual impact on the operation of these groups. Thus, for example, while providing a coercive social force that encouraged members to become involved in their respective groups (e.g., through peer pressure), they also contributed to the perpetuation of activities that, at times, contradicted the goals of the three groups. This latter effect, as the episode of the wild deer and pigs in Maine Valley

demonstrates, can frustrate efforts to manage for the biophysical concerns at the heart of a group's endeavours. This dual effect of norms and rules illustrates succinctly the issue of social capital's fungibility.

A limiting feature on internal trust networks has been the bounded range of resources that append to these relations. This tended to become problematic as the resources required by the groups became more specific. This applied not only to physical items such as plant and machinery, but also to knowledge and experience. Thus, for example, while the Waitutu group was able to meet the requirements to manage water quantity through internal resources, it did require specialist assistance to help its members improve water quality through riparian management projects. This was because the skills required for this latter task were ones generally absent from members' capacity and experience. In this latter area, network links to Environment Canterbury, developed through its relationship with this authority's Resource Care section, were important in negotiating past these internal shortfalls in the capacity. The importance of this network function was repeated in observations of the Maine Valley and Barry's Stream groups. For the external agencies themselves, meanwhile, with these networks they gained access to the resources that reside within the relevant local communities. A Barry's Stream group member summarised the reciprocal character of these network relations to me in an interview, noting:

I suppose at the end of the day they are going to be an assistance financially, and they [Environment Canterbury] are going to probably get some gain out of the group being there and trying to administer what they hope will be done (Member, Barry's Stream, August 2000).

Several factors, however, previously described in 5.3.4, may act to confound the attempts to build and maintain these networks. For instance, problems generated by issue loading, the multiple responsibilities of an authority and their institutional / bureaucratic approaches to management, and the effects of certain norms and social rules can all conspire to complicate external network relationship building. Table 5.2 summarises, in more detail, the specific contributions that aspects of social capital have made to the effectiveness of the three productive-oriented groups in this study. Consistent with the arguments of social capital theorists, the facilitatory and

connective properties of trust are shown to conspire as key positives in the operation of these organisations. Conversely, this aspect of social capital can also contrive to impede collaborative action, as when parties are not permitted to participate in a CEM initiative because 'they are not trusted'.

Table 5.2 Contribution of social capital processes to the effectiveness of the Maine Valley, Waitutu and Barry's Stream community environmental management groups

Positive Contributions

- Internal trust, based on reciprocity of perspectives, provides basis for connectivity and exchange of goods and services between members.
- Internal trust provides flexibility and capacity to respond quickly to events.
- Norms, rules and sanctions operate to uphold and encourage behaviour that assists in the accomplishment of group objectives.
- External networks, based on formal patterns of exchange, provide basis for the exchange of goods and services.
- External - internal network linkages provide linkages by which authorities can seek to accomplish their management objectives.
- Norm and rule wise, CEM provides a more acceptable form of managing for environmental issues than regulatory approaches.

Negative Contributions

- Norms and networks permit for certain activities that compromise the prescribed objectives of these groups.
 - Internal networks are limited in the degree to which they can provide access to goods and services.
 - Processes associated with internal connectivity can interact to shut out certain stakeholders and the goods and services they could provide.
 - Processes, such as issue loading, erode internal / external network linkages.
-

b. The socially-oriented groups

Starting with the issue of trust, amongst the socially-oriented groups it appears to have been less important as an initiation variable in the initial stages of CEM's development, compared to the productive-oriented groups. Instead, the aforementioned 'helping the environment' norm was the most significant binding factor at the initial organisational phase of these groups. This observation is consistent with the theoretical arguments that situate CEM in the 'new social movement' narrative, where people with shared interests combine to achieve environmental goals (see 2.2.3). The environmental focus of this norm obviously varied across the three groups. In the Kemp's Drain and Hague Stream studies, it was specific and related to the improvement of salmonid habitat. In the Waimara case, it

was less precise and was oriented around notions of estuary 'improvement'. A consequence of this normative function is that the appeal of these groups, especially the former two examples, tended to be limited. This had the subsequent effect of limiting the capacity of these groups to meet their resource needs through internal networks. In the case of the Waimara group, it was able to negotiate its way past this issue through the building of network linkages with external organisations, such as the New Zealand Landcare Trust and Environment Southland. These linkage opportunities, in contrast were, not available to Kemp's Drain initiative in the early 1990s.

Interestingly, by also having a less specific focus than the other two socially-oriented groups, Waimara Estuary Care was able to maximise the external number of agencies that its work was attractive to and which could therefore be approached for assistance. This extended from the World Wildlife Fund to Environment Southland. In addition, the Waimara group demonstrated a capacity to work through the bureaucratic procedures that face groups seeking funding from outside organisations. This ability, in itself, appears to have been a product of certain skills that *resided* within the group's membership. The availability of these skills and their capacity to capture funds has had a major bearing on the performance of this group, a point iterated to me by one of its members in an interview:

Me: *What has allowed you to access the support that your group has?*

Informant: *I am not sure, but once again I would probably have to say Brian. He seems to have been able to get on to or find sources of funding, or spend the time looking for them and finding them. But also he has a way with words. He is able to write it down, help to do a good report or application, which a lot of us don't feel that we could do (Member, Waimara, November 2001).*

This observation suggests that strategies that help groups develop the skills, described in the above statement, or alternatively make it easier for groups to network resources, would represent a policy measure that agencies could implement to enhance CEM activity. This point was recently recognised by the *Community and Voluntary Sector Working Party* (2002), which acknowledged the bureaucratic demands imposed by agencies supplying resources to community groups as an inhibitor to voluntary action in New Zealand.

Of the other social capital variables, unlike the productive-oriented groups, sanctions enforced by peer pressure were not a key factor in managing participants' collective action. One reason for this was the capacity of people, if they became aware that their actions were not acceptable, to simply opt-out of a group, without the repercussions that people living side-by-side, as in the productive-oriented groups' cases, could face. In lieu of the power of social sanction, what appears to have maintained members' involvement was the enjoyment of participation, a quality that was not noted by the members of the productive-oriented groups interviewed³⁸. This comparison is reflected in the contrasting responses from socially-oriented and productive-oriented members when asked about the enjoyment of CEM participation:

On the [work] days we had a pretty good time socially. I think people enjoyed being out, and some found it a good excuse to get out in the winter (Member, Kemp's Drain, June 2001).

Me: Do you enjoy trapping ferrets.

Informant: Not particularly, no. It's very time consuming, with very little result (Member, Maine Valley, August 2001).

Because of the relevance of enjoyment and the 'do something for the environment' norm as glues and lubricants of collective action amongst the social-oriented group members, it was important that the members of these felt they were achieving something positive from their actions. Members of both the Hague Stream and Waimara groups did feel that their participation in the initiatives of these groups had achieved something. In contrast, this sentiment was less easy to discern in the comments of Kemp Drain informants. The fact that the group was very restricted in what it could do in the Drain and the difficulty of the work involved, suggest that the level of environmental accomplishment was not sufficient for the maintenance of participant commitment. Again, as an insight, this suggests that some tangible return on participation in the case of this group type - or what Weick (2001) describes as 'small wins' - is an important attribute for maintaining collective action when traditional social capital variables are not so influential.

³⁸ There was, however, a *satisfaction* associated with the work undertaken by the members of these groups. Members of the Maine Valley group, for example, described to me the satisfaction they gained each time they trapped a ferret.

Table 5.3 summarises the positive and negative contributions that social capital made to the effectiveness of the social-oriented groups in this study. Like the previous table, it highlights certain points, including the importance of a 'help the environment' norm as an element facilitating group co-operation. Concurrent with the productive-groups, meanwhile, external network linkages appear to have held a similar significance as a variable facilitating collective action. What has premeditated this shared characteristic has been the corresponding pattern of low membership numbers (generally less than fifteen). Because of this, re-invoking Granovetter's (1973) thesis, it has been important that groups have been able to have linkages with outside actors and organisations to facilitate access to goods and services. This quality of group membership appears to be a common feature of CEM groups elsewhere in New Zealand (e.g., see Legat, 1998), and gives a further reason

Table 5.3: Contribution of social capital processes to the effectiveness of the Kemp's Drain, Hague Stream and Waimara Estuary community environmental management groups

Positive Contributions

- Shared 'help the environment' norm provides basis for connectivity.
- External linkages provide access to capital resources (especially Waimara group).
- Local linkages provide access to capital resources (especially Waimara & Hague Steam groups).
- External linkages used by the Waimara group to divert potential conflict over estuary issues from affecting the group activities in the local environment.

Negative Contributions

- Norms lack power of sanction to ensure the maintenance of member participation.
 - Network building to external actors and organisations complicated by such factors as narrow group focuses, institutional requirements and, historically, lack of institutional support.
 - Limited capacity within internal membership networks to meet resource requirements.
 - Above effect reinforced by limited membership numbers.
-

as to why external linkages are necessary for promoting CEM effectiveness within New Zealand. This insight helps to explain the seemingly paradoxical situation, wherein top-down processes (i.e., resource exchange services) appear necessary for the maintenance of bottom-up institutional arrangements, such as CEM groups. I now proceed to the final objective theme - implications for theory.

5.4.3 Theory of social capital and community environmental management

The insights garnered from the social capital framed exploration of CEM raises implications for the theory of social capital and CEM. Placing these in context, at the general level it suggests that the presence of social capital can facilitate the management of collective action problems, including those that confront common property institutions (e.g., Heiman, 1997; Salamon et al., 1998). Theorists and practitioners alike have subsequently examined ways that social capital can be formed and mobilised to give rise to desirable patterns of environmental action (e.g., World Bank, 1998). There thus exists a strong link between the CEM narratives described in Chapter Two and the concept of social capital, especially the common property institution and community expressions.

The first assumption to be questioned is the theoretical question of where social capital is thought to reside. For a number of leading theorists, such as Putnam (1995a), Fukuyama (1995) and North (1990), the source of social capital is attributed to relations at the group and even nation level. In contrast, this research endorses an actor-centred notion of social capital's origins, grounded in individual interactions that have cognitive-interpretative roots. In invoking such an origin view of social capital this notion steers away from the communitarian argument that its existence is contingent on the presence of a vibrant civil society (e.g., Putnam, 1995b). Instead, what is suggested in this inquiry is that shared meanings, at the level of person-to-person exchange, are fundamental to its development. Such an appreciation is, by virtue of its personal and interpretative origins, not suited to standardised quantitative investigations. Because of this there arises a need, if researchers are to further understand the intricacies of social capital, for qualitative studies that are sensitive to individual and shared interpretations and the social contexts in which they evolve.

Through the 1990s, a number of practitioners have argued that the promotion of CEM should be centred on the creation and nurturing of stocks of social capital. In her account of Philippine reef fisheries, for example, Buenavista (1998) has argued for the rejuvenation of local social capital as a device for reducing dilemmas within these systems. Observations from this study on reciprocal network capacities, challenge the contribution that such strategies can make to CEM efficacy (see

Section 5.3.2). They do so by suggesting that despite the presence of intra-group networks, there may not exist the resources amongst the actors involved to meet the needs of resolving such dilemmas. With this insight comes an appreciation of the importance that the willingness of authorities to supplement the internal resources of CEM groups can contribute to their effectiveness. The opportunities created for the Maine Valley, Barry's Stream, Waitutu and Waimara case studies to extend their operations beyond non-specialised tasks, through such linkages, are cases-in-point from this research. Findings from this study therefore endorse these strategies, while challenging policies that centre solely on the building or enhancement of social capital, without the due consideration of internal resource issues. Further, it suggests that the support functions of external agencies can become more effective by ensuring that they are reflexive to the needs of groups; that is by recognising and responding to their specific resource requirements as they arise.

Interestingly, it also appears that the development of inter-group exchange networks, such as those managed by the Animal Health Board and Environment Canterbury, have assisted in defusing some of the adverse effects that post-1980s social change has had on New Zealand society (see Russell, 1994). These changes, which have included the demise of schools and certain services (e.g., post offices and banks) have, in the parlance of this chapter, contributed to a decline in the density of traditional rural social exchanges. These exchanges have been reduced further by technological change (e.g., the internet) and the rural drive for increased productivity, which in combination has sparked a lessening of reliance on ones neighbours³⁹. This has encouraged, in post-1990s rural New Zealand, an attitude of independence, both from the state and ones neighbours. An interview comment from a Maine Valley informant captured these particular themes and is reproduced below:

When we first arrived on the road we worked in with our immediate neighbours and shared mustering for a couple of seasons. Since then we have not had such an arrangement with any neighbours. I am not sure why such co-operation ceased, but believe it is an overall societal shift towards more independence from one's neighbours (E-mail comment, Member, Maine Valley, August 2001).

³⁹ This is because one has been able to meet resource needs through other networks (i.e., technological), while on the other hand one is now in competition with their neighbour.

While it can be anticipated that these tendencies will have detrimentally affected aspects of social capital and the contribution it makes to CEM activity, it is apparent from this study that the network services of agencies have circumvented some of the shortfalls created by these changes (e.g., by providing inter-network relations to replace intra-network forms). These networks provide, from a social capital perspective, further endorsement for the promotion of these services by external authorities.

Thirdly, while descriptions of inter-group social capital / CEM relations have tended to concentrate on patterns of overt exchanges, observations in this inquiry have highlighted the importance also of covert networks. In the course of this study several examples of such networks emerged. A case-in-point entailed various instances of Environment Canterbury employees, working with the Barry's Stream and Waitutu groups, forewarning groups of potential events and activities (some of them by their own agency) that would impact negatively on their well being. Through this service, these staff provided an extra-ordinary benefit to these groups. Looking at the source of this, the most prominent factor was the informal trust relations that these agency staff had established with these groups and their wish to not see these compromised by the actions (or their apparent complicity with) of their employers. By forewarning them of developments by their own organisation, these employees were able to distance themselves from the actions of their employers. This has had the effect of maintaining, even reinforcing these informal trust relations, as well as providing a benefit to the groups themselves (Fieldwork, August – September 2001). The existence of this pattern of informal and invisible exchanges indicates a further quality of social capital that practitioners working with CEM groups need to consider when assessing its contribution to collective action.

Finally, as Woolcock (1998) has noted, social capital has suffered from the on-going accusations of its detractors that it promotes truisms and arguments that are tautological in nature. The source of these criticisms is the tendency, within many accounts of social capital, to describe a reinforcing spiral in which social capital begets social capital (see Portes, 1998). Sobels et al. (2001) notes that this has reduced the utility of the concept by making it difficult to operationalise, because

process and outcomes have become confused in public policy. In the context of these arguments, findings from this study contribute to an understanding of social capital as a cause of, and influence on, collective action rather than as an outcome. As such, it highlights a number of variables that can be drawn on to organise strategies that operationalise social capital into supportive strategies for CEM. This includes, for example, the recognition of meaning as a trust variable and the importance of external networks as gateways to goods and services. At this point, I will now close the chapter with a set of summary points and conclusions.

5.5 Conclusions: How and Why is Social Capital Important to Community Environmental Management?

The research set out in this chapter confirms the role of social capital as a contributor to collective action within CEM groups operating in New Zealand. As part of this, it has demonstrated the forms and functions social capital occupies in this role. Further, it has highlighted that there are both positive and negative aspects associated with the contribution it makes to human collective action. Some of the other prominent findings advanced in this chapter are: (a) the recognition of the importance of trust as a variable connecting together actors within productive-oriented groups; (b) the significance of networks - especially external ones - as linkages to goods and services; and (c) the existence of obstacles that can negatively impact on the capacity of social capital to produce positive benefits for CEM participants.

Moving to theoretical implications, this study has diverted from recent accounts that have examined social capital as a product of 'learning processes' (e.g., Sobel et al., 2001). Its focus, instead, has included the recognition of the causative role that certain micro-social processes within social capital (i.e., those associated with meaning formation) can play in collective activities. In exploring these roles, this research makes the contribution of re-capturing the concept from applications that have distanced social capital from human social life (see for example, World Bank, 1998). Concurrently, by identifying the different contributions that aspects of social capital can make to collective action (see Table 5.1), this research advances variables that can be applied to strategies that seek to operationalise the concept,

including programmes with a CEM focus. In addition, these same variables may also be drawn on to promote the advancement of theory within the social capital field itself.

Reflecting on the above points, it is apparent that strategies that emphasise the building of social capital as a panacea for assisting community-based initiatives are overly simplistic in their appraisals of what it can contribute to collective action. Nevertheless, they persist at the popular level of policy-comment within New Zealand (e.g., Kerr, 2000). Clearly, insights from this chapter intimate that building social capital will have questionable results if the goods and services required do not reside within the resultant network relations. This highlights a necessity for those who promote CEM to recognise the resource needs of groups, and to identify how and when it is best to supplement these with external assistance. It also indicates a need to be aware of those aspects within social capital itself (such as internal norms) that can hinder, rather than assist, the accomplishment of CEM programme objectives. Finishing on this point, the next chapter moves on to a second lens of inquiry, which is the notion of nature as a social construct, and explores the implications that such processes can have for the form, function, performance and theory of CEM?

Chapter Six:

Findings Two: The Social Construction of Nature and Community Environmental Management

We no longer understand nature therefore as either a singular or a distinct objective category that can be described, managed, and theorised apart from culture or standpoint. Instead, natures are situated within unstable fields of identity, economy and politics; natures – social and physical – are caught up in processes of contest and hybridity (University of Washington, 2001).

6.1 Introduction

Within the command and control paradigm (see Chapter Two), the prevailing image of nature has traditionally been centred on impressions of a stable and objective entity, separate from human social life (Irwin, 2001). 'Things' in this sense, such as salmon and trees, are considered to reside 'out there' where they await the human hand of management. Concurrently, those who talk of and describe CEM have typically invoked similar realist images of nature (e.g., see Ackroyd, 1991). Post-modern critiques of science and reality have challenged these assertions by suggesting the existence of 'social natures'⁴⁰; that is natures formed within processes of social interpretation. This appreciation has prompted studies that have explored the extent to which notions of nature change and nature management are influenced by processes of social construction (see Castree and Braun, 1998; Franklin, 2002; Irwin, 2001; Murdoch, 1997; Proctor, 1998).

In this chapter, I have drawn on themes from the social construction of nature lens to provide a further frame for my exploration and inspection of CEM. From the application of this lens, four emergent arguments arise that I will explain in detail in the proceeding sections. These can be paraphrased as:

- *across the six CEM groups in this study there preside three dominant frames within which actors' social representations of nature are grounded;*

⁴⁰ In this study I use the term 'social nature' to refer to nature as a product of social construction and 'physical nature' to refer to an understanding of it as a material reality separate from human authorship.

- *these nature frames are described in this study as: (a) productive; (b) consumptive; and (c) administrative;*
- *these nature frames play central roles in how the actors who retain them see the material world and conspire to act towards it and other people; and*
- *one form this takes is the use of CEM institutions by different actors to impose their nature constructions on to the physical environment and other humans.*

To unravel the intricacies behind these arguments and assess their relationship to my research objectives, the following sections are included in this chapter. The first focuses on the question of where the social construction of nature frames identified in this study have arisen from. The second looks to explore how the employment of these frames by different actors affects the way the physical environment is responded to. The third section focuses on the issues of how people involved in CEM utilise the opportunities created by the presence of these organisations to assert their social natures onto other humans and the biophysical world. The final section explores the implications of the social construction of nature process for CEM itself, human actors and the physical environment. The relationship between these sections and the arguments of this chapter are summarised in Figure 6.1. Before proceeding with the interpretative part of this chapter, however, a fuller introduction to the theoretical themes within the lens is provided.

Figure 6.1: Presentation of analysis - schematic

6.1.1 The social construction of nature: Theoretical approaches

The recent origins of the social construction of nature approach can be traced to broader developments in the field of social construction theory (Berger and Luckmann, 1966; Velody and Williams, 1998). From the 1960s, the impetus within this field has been spurred by efforts within science to understand the metaphysical dimensions of 'knowledge' and 'reality' (Demeritt, 2002). In this task, researchers have gone beyond the commitments of 'normal science' to focus on the roles that social meaning and symbols play in the determination of social action (Burr, 1995). The evolving dialogue of social construction has subsequently placed the role of meaning at the heart of this endeavour. Meanings, as used in expressions of social construction⁴¹, can be comprehended as the understandings of things and behaviour derived through processes of human interpretation and negotiation (Blumer, 1969)⁴². The social role played by these is to provide people with opportunities to make sense of what they observe in the physical world, and to act as guides for their orientations and actions (Cohen, 1985). Through the presence of meanings, for example, humans do not have to relearn how to respond to 'things' (e.g., traffic lights) or to 'actions' (e.g., a raised fist) each time they are confronted by them. This is because these 'things' and 'actions' are ascribed with *symbolic* qualities that humans respond to on the basis of the meanings they hold for them. In turn, meanings are inherently relative, as they are attached to a time and space and do not necessarily reside in the same form outside of these.

The *social construction of nature* approach draws on the above themes and explores how humans give meaning to the physical world and the effects this has on interaction, both human-to-human and human-to-non-human (Castree and MacMillan, 2001; Hannigan, 1995; Irwin, 2001). What is asserted in these arguments is the understanding that humans do not respond to a single, free standing material world, but to one that is constructed, partially at least, through social processes. Because of this, the likes of salmon (Scarce, 2000), mushrooms (Fine, 1998), landscapes (Grieder and Garkovich, 1994; Helford, 2000) and the concept of

⁴¹ Social construction is best appreciated not as a single theory *per se*, but rather as a series of intermingled theoretical perspectives spanning the metaphysical divide between realist and idealist understandings of reality (Demeritt, 1996).

⁴² This moves a step beyond the ethnomethodological approach in the previous chapter by acknowledging the role of person-to-person interaction as part of the meaning building process.

wilderness (Cronon, 1995) are revealed to have dimensions that are social in character. Further, within the arenas of resource management, an owl becomes the symbol for forest protection (Proctor and Pincelt, 1996), while environmental disputes are understood, not solely as products of sectoral competition, but also as the consequence of the openness and uncertainty of what counts as 'nature' (Braun and Wainwright, 2001). With these representations in mind, the task for this study became one of unravelling the meanings given to the physical world by those involved in CEM and understanding the implications of these for human action. It is this assignment that occupies the greater part of the proceeding analysis. This chapter now moves to the first of the issues that require consideration, namely the exploration and description of the nature-frames that underscore the process and outcomes related to the CEM groups in this study.

6.2 Frame Exploration and Description

The inquiry in this chapter is premised on the argument that three dominant frames of nature imbue the narratives and actions of the human actors across my six case studies. These are: (a) productive; (b) consumptive⁴³; and (c) administrative. The qualities of each frame are explored below.

6.2.1 Productive frame

The notion that people's view of nature is premised on productive considerations is not unique within the social sciences (see Burgess et al., 2000; Paolisso and Chambers, 2001). Commonly, it is recognised as central to how farmers shape their interpretations of the physical world (McHenry, 1998). Given the centrality of farmers 'as actors' in the Maine Valley, Barry's Stream and Waitutu case studies, it is therefore not surprising that productive framed images were observed to imbue the events and activities in these studies. In Maine Valley, for example, the

⁴³ The differentiation between productive and consumptive draws on Frykman and Lofgren's (cited Neumann, 1998, p. 21) argument that two landscapes have evolved under industrial capitalism, one based on each of these concepts. In the productive landscape, the focus is placed on 'rationality and profit'; in the consumptive it turns to 'recreation and contemplation'. In this study, the notion of a productive nature frame is used to depict interpretations centred around economic concerns, while the consumptive nature frame is used to depict amenity, intrinsic and spiritual centred interpretative interests. Given these differentiations it is not surprising to subsequently observe that the social-based groups are strongly imbued by consumptive nature frame views and the productive groups with productive nature frame perspectives. This does not mean that the frames and groups types are mutually inclusive however. As described in the main text, elements of consumptive nature frame considerations were observed amongst the productive-oriented groups although, as I explain, these were sub-ordinate to productive nature frame considerations.

observation that certain animals are socially constructed as 'pests' is grounded, I suggest, in the shared understanding of Local Initiative Programme members that the presence of these organisms contributes adversely to beef and deer production⁴⁴. The following comment from a Valley resident captures the productive themes of this interpretation:

"Well financially it [bTB] is a burden because I have got no down country land; it means that I have to change my policy on cattle and deer . . . yeah it costs me a lot of money" (Farmer, Maine Valley, July 2000).

The label of 'pest' is itself a social construction, for no animal is intrinsically a pest in a material sense; it is a title ascribed by humans (Irwin, 2001). In the Maine Valley context, the label is ascribed to ferrets and possums because of the biological relationship between them and an economically damaging disease. The strength and extent of this 'pest' interpretation is demonstrated, in turn, by the willingness of the Maine Valley farmers to engage in collective action to control these animals (Fieldwork, June 2000 - August 2001).

In the Barry's Stream and Waitutu cases, the presence of productive themes in farmers' social construction of nature is reflected in numerous ways. Amongst the membership of the Waitutu Abstractors Group, it is demonstrated in the tendency of members to ascribe meaning to the local waterways, primarily, based on how they impact on agricultural production. Of relevance here is the construction of waterways as valuable because of their function as sources of water for irrigating. Concurrently, claims about waterway degradation appear to be unsettling to Waitutu residents - and consequently a spur for collective action that remedies it - because of the threat it poses for their access to irrigation water (a productive concern). Farmer narratives from the Barry's Stream case study tend to replicate these themes. In some cases, for example, the physical nature of the stream is imaged positively because of certain goods and services it yields to the farmer. This includes, for example, a service as a fence line and the supply of stock water, and its association with fertile alluvial soils suited to intensive production. The comments of a farmer member of the group, below, captures aspects of this theme:

⁴⁴ A point of interest here is that ferrets (instead of possums) have acquired a symbolic value as the lead vector problem amongst Valley farmers. This contrasts with the Animal Health Board's administrative-based interpretation of the possum as the vector priority. The interpretative rationale behind this distinction is explored in Section 6.3.

... it's basically been a fence line or a border to prevent stock movement. It's also been a watering hole for stock. We have pumped out of it on occasions (Farmer, Barry's Stream, September 2000).

In statements where farmers expressed negative interpretations of the stream, these again appear to have been hedged around productive concerns. Aspects contributing to this representation have included the problems of flooding and stock drowning. Given such differences, the image of waterways in both case sites (i.e., their social interpretation) has oscillated between positive and negative interpretations, depending on the value placed on their physical consequences (primarily) for farming.

One must be wary, however, of over-generalising on this point (a point relevant to all the nature frames described here). In the latter two case studies, for example, I encountered farmer informants whose descriptions of the local waterways reflected what I discerned as non-productive elements. These elements tended to be grounded in consumptive (see 6.2.2) considerations, such as aesthetic concerns (Fieldwork, June 2000 - September 2002). A prevailing tendency, nonetheless, was for these actors to prioritise productive considerations over consumptive in their representations of these systems. This dynamic was illustrated aptly in the example of 'Paul Long', a Barry's Stream farmer of 60-plus years.

Regional council staff have regarded Paul as an 'enlightened' farmer, who has sought to manage the impacts of his livestock on Barry's Stream through fencing its margins. While interviewing Paul, it emerged that much of the rationale for this activity had been grounded in *consumptive* representations of Barry's Stream, particularly its aesthetic qualities. Nonetheless, permeating his image of the stream were strong themes of production, demonstrated most markedly by his described wish to minimise the amount of land 'lost' from economic use by the creation of fences along the stream's margins. Further, the fenced area itself took on, for Paul, particular images, not all of them positive, again centred on concerns about the implications for his economic activities. There was an issue for him, for instance, of how he would manage for the rank growth that grew in the ungrazed riparian margin,

and which could subsequently spread weeds onto his pastureland⁴⁵. The comments below, from Paul, echo these themes:

Me: *"So what determined the width of your riparian strip?"*

Paul: *"Probably two things in mind; to minimise the amount of our farm land that was taken away . . . the other thing is the more land you took, there's one problem with it, there'll be grass and sorts of things that will grow unabated, and somehow or other that has to be kept in check" (September 2000).*

Linking this discussion together, the elements of the productive frame identified in this study are: (a) physical nature is interpreted on the basis of its relationship to productive imperatives; (b) aspects of physical nature are thus configured as 'good', 'bad' or 'neutral' depending on how the goods and services they provide intersect with these imperatives; and (c) notions of custodianship are organised, foremost, around productive considerations. I now move onto the second of the three nature frames distinguished in this study, the consumptive nature frame.

6.2.2 Consumptive nature frame

Like the previous example, the consumptive frame provides a generalised reference for the organisation and interpretation of events and processes that arise within the physical world. It departs from the former frame, however, through the interpretative emphasis shown to elements within physical nature that are aesthetic, intrinsic, spiritual and recreational in quality. Observations suggest that this frame underpinned the various interpretations of physical nature articulated by the members of the Kemp's Drain, Hague Stream and Waimara Estuary CEM groups. Amongst Kemp's Drain group members, for example, their participation was linked to an image of the waterway as a recreational trout fishery, with different intrinsic values being associated with this appraisal. Members' participation, in turn, was based on images of restoring and improving the waterway's value in respect to these qualities, a point iterated in a member's comment reproduced below:

Yes it was something quite dear to my heart [Kemp's Drain] to try and restore a little bit of the environment there and provide some encouragement to the fish to return in numbers (Member, Kemp's Drain, June 2001).

⁴⁵ How these contrasting frames are balanced in the human interpretative process is discussed in 6.3.

Similarly, amongst Hague Stream CEM participants, the physical nature of the waterway was construed as worthy of their attention because of its association with chinook salmon (a recreational species for them) and the stream's aesthetic qualities. Within this interpretative context, the task for the CEM group was constructed to be one of 'improving' aspects of these qualities, as revealed in members' comments below:

... the stream itself, when you see it, its such a beautiful spot that you want to do something with it to make it beautiful again, you know (Member describing his rationale for participating in the Hague Stream initiative, September, 2001).

... making a better environment for the fish, by ways of fencing, keeping stock out, cleaning the stream of all debris and that ... yeah just making it a better environment to spawn in (Member describing focus of the group's activities, Hague Stream, October, 2001).

In the instance of the Waimara Estuary Care group, the images of the estuary and the meanings behind members' participation were more diverse. They still, however, reflected elements of the consumptive frame described earlier. Qualities within this included the desire for 'clean water' for recreation, and the preservation of the flora and fauna of the estuary. These qualities are iterated in the members' statements below:

I think the purpose of the group has been to enhance the beauty of the area, to improve on something that's deteriorating a bit and yeah, revegetating (Member, Waimara Estuary, November 2001).

"The estuary is one of the important parts of the food chain and needs to be kept clean and tidy, and we do our best. I would like to do something towards it because I believe that it is quite important for future generations" (Member, Waimara Estuary, November 2001).

Compared to the productive frame, the consumptive form varies in several ways. Most obviously, it does not reside strictly within utilitarian and instrumental considerations of nature; instead, it resonates with intrinsic and socio-emotional concerns. Physical nature, in this context, is interpreted on the basis of more than what it supplies in terms of goods and services. It also has intangible worth, a point that is prominent in the comment from a Kemp's Drain CEM member reproduced below:

... I feel for all waterways. I tend to have, well like how the Maori talk about having a special relationship with nature, I don't think it is unique ... as far as I am concerned my spiritual substance comes from waters and living waters at that ... there is something special to me (Member, Kemp's Drain, June 2001).

The final nature frame relevant to this study is the administrative frame, which is described below.

6.2.3 Administrative nature frame

In terms of attachment to a set of actors from this study, the administrative frame revealed itself through the activities of individuals employed by the various management authorities working with the six CEM groups. These included regional council staff (e.g., from Environment Canterbury), fisheries managers (North Canterbury Fish and Game Council) and an animal disease management agency (Animal Health Board). Observations of actors from these organisations indicated that their constructions of nature were configured around the predetermined objectives of their agencies (e.g., water quality management, Environment Canterbury). Often, in contrast to the other two frames, the resulting representations lacked local specificity; for example, the Animal Health Board's representation of the bTB vector problem (i.e., its possum focus) has evolved from historic experiences in the central North Island. This is a physical context quite different from that of the semi-arid hill country of the South Island, where Board staff have nonetheless historically sought to apply the same understandings to vector control (Interview, August 2001).

Exploring a historic example of the administrative frame and its affects on physical management, river engineer interactions with Kemp's Drain are insightful. In the context of these actors' interaction with this system, the Drain has been traditionally managed as a drainage way for the rapid and efficient removal of water (its name itself reflects the importance of this function). In this situation, the administrative frame of the engineers has transformed a physical artefact (a waterway) into a social configuration (a drain), a point made transparent in the 1992 comments of an Environment Canterbury river engineer:

The Council's main function for Kemp's Drain is to ensure its flood carrying capacity and its ability to act as an outlet for contributing drains (Reid, 1992, p. 1).

Inspecting the qualities of the frame more closely, a common feature is the faith, for those working within it, that the physical environment can be managed through instrumental and rational processes. Such outlooks are consistent with Torgerson's (1990) notion of the administrative mind, which this scholar argues dominates command and control approaches to environmental management. Typically, this mind-set is revealed through the artefacts of management plans and notions of scientific 'facts'; with the latter often acquired away from the environmental setting where they are used (see above comments on *vector* construction). Having distinguished the dominant nature frames that arise in this study, an imperative exists to identify their source. This is the focus of the next section.

6.2.4 Origins of constructed 'natures'

The contention that there exist different interpretations of the physical world pre-supposes the existence of processes that facilitate their creation. This section draws on actor examples, taken from my case studies, to identify and explore these processes. The actors used are: (a) Doug Wills, a Maine Valley farmer and member of the local initiative programme group; and (b) Danny Fisher, a Barry's Stream recreational angler⁴⁶.

In his occupation as a farmer, Doug Wills has brought, like the other actors in this study, a distinct *role* and *identity* to his interpretation of the physical environment of Maine Valley. These are defined through the socio-cultural environment that he occupies and the need for him to ensure the security of his livelihood, especially the economic viability of his farm. Other scholars have traced the relationship between farmers, their culture, need for livelihood security and the physical environment. Burgess et al. (2000) and McHenry (1994), for example, identified the tendency of contemporary western farmers to construct nature around economic considerations. Socio-culturally, Egoz et al. (2001) attributes the origins of

⁴⁶ These are *real* individuals, rather than composite characters. Pseudonyms have been used to protect their identity, a practice consistent with the undertakings set out in Chapter Three in regards to protecting informant identity.

present-day farmer interpretations of New Zealand's physical environment to historic aspects of European settler society. These included religious convictions, moral imperatives, and a suspicion and fear of the country's indigenous flora and fauna. Because of these, the prevailing image of nature that evolved amongst New Zealand's farmers, they contend, has been of an environment that must be managed to maximise production and to minimise the adverse impacts it has on this goal (also see Park, 2002).

Talking to Doug and other farmers, one becomes aware of the influence of this outlook on their social construction of nature and nature change. It is noteworthy, however, that other elements also affect his nature interpretations. During my fieldwork, for example, I became aware of the part that normative and structural⁴⁷ elements played in farmers' social construction processes. Driving along the Valley's main road, for instance, one becomes aware of the repeated examples of well-ordered farms and maintained fence lines. For Egoz et al. (2001), the source of these patterns lie in normative convictions of how a farm 'should look'. Such convictions create a strong social imperative for nature to be ordered in certain ways, a conviction that in turn influences the way that artefacts, like shrubs, grass and animals, should look. Structural elements, such as market imperatives and legal responsibilities, meanwhile deem it necessary to maximise the output of produce from a farm, and further influence the nature construction process (Cocklin et al., 2000). Local by-laws, meanwhile, also require that certain flora (e.g., gorse) must be managed in specific ways, a requirement that reinforces a distinct image of this plant as a 'weed' (see Wilson, 2002).

For a farmer, such as Doug, characteristics of the physical environment itself also play a part in the construction process. This appreciation links to the argument by some theorists that material nature is an actor in its own construction (e.g., Murdoch, 1997). For example, the way ferrets behave, such as their capacity to carry and spread bTB, has affected the way they have been interpreted by farmers in Maine Valley. In fact, it can be anticipated that were the animal not to display these

⁴⁷ The divide between human agency and social structure is one of the prominent ones that exist within the social sciences. The former focuses on action as a consequence of human free will, the latter emphasises the importance of external forces as elements shaping and determining human action (Abercrombie et al., 1994).

characteristics it would, in the case of most farmers in the Valley, be regarded with little more than curiosity, if contemplated at all.

To appreciate how elements of material nature are socially constructed within the productive frame I will look more closely at the example of the ferret and the members of the Maine Valley group. As shown in Chapter Four, amongst these actors the ferret has acquired the status of the lead bTB vector⁴⁸, a construct that places the members at variance with the Animal Health Board, and its possum emphasis. Underpinning the vector interpretation of Maine Valley farmers was: (a) an awareness of the negative impacts that bTB could have on their economic returns; (b) a normative appreciation that one should take action to control bTB vectors; (c) legal requirements to undertake vector control activities; and (d) the qualities and behaviour of ferrets themselves⁴⁹. The economic and social normative themes are captured in the below two comments from Maine Valley farmers:

Well financially it is a burden [bTB] . . . yeah it costs a lot of money
(Member, Maine Valley, July 2001).

Certainly, if you had it [bTB] and didn't look as though you were doing anything about it then people would get really annoyed with you (Member, Maine Valley, August 2001).

The relativity of this construction to a spatial context, meanwhile, is revealed by the alternative image that ferrets hold for farmers along the North Canterbury coastal foothills. Amongst these actors, far from being configured as a pest, for a number of them it is considered a 'friend' (Interview transcripts, June 2001). As for Maine Valley farmers, this construction is still underpinned by productive considerations, although for coastal farmers the 'friend' construction of ferrets is based on this animal's rabbit predation habits. For such coastal farmers, the rabbit is more economically damaging than the ferret, thus any thing that aids in its control is assigned a positive interpretative value.

⁴⁸ The scope of the former image was demonstrated by the fact that no informants I interviewed from the group expressed disagreement with it.

⁴⁹ For example, biological attributes of the ferret mean that it shows high concentrations of bTB amongst its population, somewhere around 8-10% compared to 4% for the possum (Interview, August 2001). This has translated across to the autopsy data gather from animals trapped in Maine Valley, the rates of bTB shown in these animals reinforcing the farmer interpretation that these animals are the key bTB vector issue.

Although an actor from a different setting and frame, the means by which Danny Fisher constructs nature reflects the role of similar aspects interacting together in the development of his nature interpretations (e.g., norms, nature as an 'actor'). In Danny's case, his *role* and *identity* as a dry fly angler sees him bring a consumptive interest to Barry's Stream. The fulfilment of his angler role requires, for example, certain qualities to be present in the physical world. These include the presence of brown trout and clear water. Within this association, physical nature and nature change are determined as 'good', 'bad' or 'neutral' depending on how they impact on the capacity of Danny to meet the expectations of his angler role and his associated interpretations of the waterway. He communicates these qualities in the following comment:

So yes, I guess I became concerned about the deterioration of the stream at the time that middle stretch - which for a long time was my favourite stretch of the stream - when I noticed the fish numbers dropping off there (Danny Fisher, August 2000).

There is also a strong contextual specificity associated with Danny's interpretation of the stream. This is based on his past enjoyment of fishing the waterway, from which the stream has acquired a special symbolic value to him⁵⁰. For Danny, concerns about the physical changes in the waterway need to be considered against the consequences they have for the symbolic qualities the stream holds for him. Physical nature, again, is not neutral here, but plays an actor role. The material properties of silt dislodged into the waterway by cattle, for example, play a part in reducing water quality and hence in the concerns of Danny and other anglers about the condition of the stream. This point is reflected in the comment of yet another Barry's Stream angler, aggrieved by the physical changes in the stream that occurred in the late 1990s.

What annoys me more than anything is the quality of the water, the visibility of the water, the dirtiness of the waters. It's disgusting (Angler, Barry's Stream angler, November 2000).

Conversely, many of the farmers I interviewed in the Barry's Stream catchment did not attach negative meaning to the presence of silt in the stream.

⁵⁰ Franklin (1998, p. 361) describes the affinity of recreationalists to particular localities as 'spatial locatedness'.

Given the previous description of farmer nature interpretations, this is not unanticipated, as one can appreciate how the presence of silt in the waterway would have little immediate bearing on the productive considerations of local farmers⁵¹. A point iterated by one such Barry's Stream farmer (and care group member), below:

I can't see any problems in the Barry's branch at all. Leggs have got cattle next door; they chew a bit of the bank down a bit but [they have] been doing so for the last 80 years (Barry's Stream farmer, August 2000).

Before ending this section there is a question that requires consideration. That is the issue of how to account for the different, and sometimes conflicting, roles and identities actors bring to the physical world. In the parlance of this study, how does a person who might farm and also fish Barry's Stream ascribe meaning to the physical changes that occurred in it through the late 1990s? Understanding how this potential conflict is negotiated for within an actor's interpretative world can be accomplished by exploring the example of drain management in the Barry's Stream catchment. Amongst the farmers I interviewed living in this area, it was understood that drains performed an important physical function in removing water from farmed land, thereby ensuring their continued productivity. Yet drains and their periodic maintenance cleaning have been recognised, including by some Barry's Stream farmers, as causing adverse effects on the instream environment of the waterway⁵². Despite this, one still discerned within the comments and behaviour of the farmers concerned by this situation, an interpretative preference for upholding existing drainage practices over any concerns about the biophysical consequences of these. The issue here is how are such differences accommodated in actors' interpretative nature frames?

Two factors from this case study offer an explanation as to how these are accommodated. Firstly, farmers in the Barry's Stream catchment, who did express concerns about water quality in the stream (n=3), tended to do so from a consumptive frame perspective; that is, they expressed these interpretations based, for example, on

⁵¹ These views have tended to change, however, as the linkage has been developed between access to water and the condition of the stream's aquatic environment. Encouraged by the regional council, this connection has progressively drawn farmers into a network whereby silty water has been constructed as an environmental 'bad' that requires management (see further discussion in 6.3.3).

⁵² Most prominently, by discharging silt into the stream.

aesthetic concerns. At this point, they can be argued to have interpreted nature from outside of their dominant farmer (productive) frame. However, in situations where such interpretations contradicted economic considerations, farmers with these dual representations of waterways were observed to revert to their productive-framed representations of them. Within these, the condition of the stream was not interpreted to be significantly degraded by drainage activities, especially compared with the claims made by anglers (Fieldwork, July 1999 - December 2002). This is not a surprising admission, because for the farmers in this study drains have been linked to their economic survival and well being, as they have removed excess water from their properties and supplied irrigation water. This balancing and preferencing process was a recurring pattern across the farmer actor groups involved in this research.

As significantly, this research identified that even in cases where farmers might wish to organise their actions around consumptive frame interpretations of nature, they have encountered difficulties in doing so. As noted previously, for example, there are normative imperatives present in the Barry's Stream catchment that encourage farmers to maintain their drains in accordance to productive rather than consumptive nature interests. Similarly, a range of structural forces associated with the economic survival of a farm unit, compel farmers to conform to the prevailing representation of drains, even if doing so is inconsistent with their personal social natures.

This observation is interesting, in turn, for what it suggests about the dynamics between the human constructions of physical nature and human action towards it. It can be discerned from the above example that forces *outside* of the construction process can play a role in human action towards the physical world. Because of this, it cannot be said that people act towards the world as they interpret it. Instead, it is apparent, from the observations garnered in this research, that interpretations are filtered through variables that affect what action will and will not be tolerated, regardless of people's interpretations. *This places an important caveat on the transition from social interpretation to human action.*

The preceding analysis has drawn on case study examples to highlight the processes by which different actors were discerned to socially construct nature. Figure 6.2 summarises this process in diagrammatic form, with it emphasising the interactive role that socio-cultural variables, physical nature and social structure occupy in this process. The brackets, meanwhile, demonstrate the embeddedness of any resultant social natures, which are the products of the social construction of nature process, within specific spatial and temporal settings. At this point, it is possible to move on and consider the implications of the processes described in this section for the CEM approach. This is the focus of the rest of this chapter.

Figure 6.2: The interactive elements in the construction of social nature

6.3 'Nature', Interpretation and Action: Physical Implications

In this study, the social construction processes I have described were observed to affect CEM in several ways. These can be broken down into three parts, which are: (a) the make-up of the social natures that CEM seeks to manage; (b) how interpretations of nature affect physical activities undertaken within CEM organisations; and (c) the politics of CEM.

6.3.1 What nature is being managed here?

Across the prominent narratives of CEM, described in Chapter Two, the prevailing image is of individuals acting collectively to address local biophysical

issues through 'community' centred enterprises (e.g., Environment Canterbury, 2003). One of the assumptions attached to these narratives is that agreement exists over what the biophysical world is and what needs to be accomplished to manage it (e.g., Hobbs, 2001). In other words, there is no attention given to the role that social construction may play in varying these. The processes I have described in the preceding section challenges this prevailing understanding. Exploring the narratives of informants from the Barry's Stream study (anglers, farmers and regional council actors) it is apparent, for example, that these carry marked variations in the interpretation of the waterway, the changes in its water quality over the 1990s, and the causes of these. This is reflected in the respective comments of a farmer and angler who had respectively interacted with the waterway for sometime:

I mean I'd just about not waste my time or give a toss about the stream, you know. I think there is nothing wrong with the system (Farmer, Barry's Stream, August 2000).

Your Barry's Stream, as advertised in the Sports Fishing guide, is no other than a dead river . . . the pollution is absolutely beyond a joke, there are no fish in the river at any point. . . (Angler correspondence to the North Canterbury Fish and Game Council, [emphasis in original], Anonymous, 1999).

As inferred from the above statements, different interpretative frames can generate very different appraisals of nature and nature change. Subsequently, any management initiative that seeks to address issues based on a specific representation (e.g., an angler's notion of a degraded stream) can expect support, resistance or indifference from those holding different representations. One of the problems that this can give rise to for CEM, as in the Barry's Stream example, is a situation where *one set of actors* (in this case farmers) *are expected to manage for the social nature interpretations of others*. The capacity for this to lead to conflict, because of the different social representations of nature involved, is captured in the episode described below.

In this event, an angler concerned at the plight of the stream, became disillusioned at what, to him, was the slow pace at which a local farmer was addressing the impacts of his stock on the waterway (see Plate 4.7, Chapter Four). The farmer at the centre of this angler's concerns considered these claims of inaction

to be unjustified. For him, the decision to undertake any work along the stream bank was a matter of aesthetic improvement rather than anything associated with ecological change in the stream. Further, he was not convinced that claims the waterway was degraded could be linked to his agricultural activities directly. For this farmer, concurrently, any ('aesthetic') improvement work needed to fall in behind, as I have suggested earlier, the productive imperatives of operating his farm. Given such interpretative differences, it is not surprising that this actor was taken aback by the angler's claims against him, a point highlighted in the following comment made from him:

I was very, very annoyed, which may have been obvious from my reply, because we had made a good start, and these things take time. At the time I was a pretty busy farmer and the time spent down on this project was done in my recreational time (Farmer, Barry's Stream, December 2002).

This comment can be compared to the concerns of the disgruntled angler, transcribed below:

I am considering writing letters to regional councillors because I am annoyed at the glacial rate of improvement. They, in effect, asked for a grace period in order to get some improvements going, but I think that they are not acting in good faith (Angler, Barry's Stream, November 2000).

A further example of the tensions created by the input of different social natures into the CEM process is revealed through aspects of the relationship between the Maine Valley Local Initiative group and the Animal Health Board. In this case study, Board employees, through their administrative frame, have acted towards the bTB vector issue in North Canterbury as predominately a matter of possum control. Amongst the Maine Valley farmers the ferret, in contrast, has been constructed as the lead animal in their interpretation of vector issues in the Valley. These divergent interpretations have run on to affect the relationship between Valley farmers and a number of those working for the Board, with dissatisfaction being expressed by farmers at how the Board has organised its pest management efforts (Fieldwork, June 2000 – September 2001).

Despite the above processes, observations indicate that differences in meaning can be accommodated for within a CEM programme. Experiences from the Waimara Estuary and Kemp's Drain groups provide insights into how this is able to

occur. In the case of both groups, divergent meanings over what actions were needed to manage for the physical natures at the centre of each group's activities were observed in informants' comments. Yet in both cases, group members appear to have been able to work together because they were able to consolidate their different meanings behind their CEM efforts. In other words, for the actors involved, their community-based activities have taken on a symbolic quality that has encouraged them to act collectively to change the physical environment. In the case of the Waimara Estuary Care group, this has been associated with a shared symbolic image of the Estuary. As a social entity, this image has had sufficient scope to accommodate a range of different representations of the Estuary, a point noted in the comment of a member below:

I think there is a general environmental, conservation theme that runs through the group and that is associated with the estuary . . . so it is not a group of environmentalists, its a fairly broad cross section of the community, and I think that they share a general concern that the estuary is an asset (Member, Waimara, November 2001).

Amongst the members of the Kemp's Drain initiative, this symbolic aspect, was tied to the *physical act* of salmonid habitat restoration itself, a point highlighted in former members' comments below:

I guess that was a commonality, we all had a concern for the environment and wanted to do something about it in some small way. That was a common thread (Member, Kemp's Drain, June 2001).

I don't think anyone who worked there wasn't interested in conservation measures of some sort. I think we had a conservation bond. I don't think there was any doubt about that . . . I think we all wanted to improve the fishing in Canterbury; we had probably seen a lot of the deterioration occur over the last number of years and yeah I think there was a common bond of conservation measures and angling interest (Member, Kemp's Drain, October 2001).

In the next section, I move on from the question of nature's form to explore the implications of its social construction on the physical activities undertaken through CEM initiatives.

6.3.2 Social natures and physical action

The understanding that people seek to act towards the physical world as they interpret it has implications for the activities that are managed through a CEM

programme, be they ferret trapping, removing stock from a waterway or wetland restoration. Understanding the form and affects of these is a contribution that the social construction of nature frame can make to the development of CEM theory. In the proceeding analysis, I draw on the example of riparian zone management - an activity relevant to all of my case studies except the Maine Valley example⁵³ - to explore this process and its effects.

Riparian zones are commonly interpreted as the physical interfaces between terrestrial and aquatic ecosystems, comprising land areas affecting and affected by aquatic systems (Gray, 2000). Within New Zealand, riparian zone management has evolved as a means for managing the effects of productive agricultural activities on waterways, with the fencing and planting of these areas being promoted as a management tool for improving water quality (the term 'riparian strips' is usually used to describe areas of land set aside in this way) (see for example, Environment Canterbury, undated_a). Consistent with the previous discussion on nature frames, observations from this study reveal that interpretations of the form, function and the management of riparian zones varied markedly across the actor groups in this study. This situation had subsequent implications on the physical form that riparian strip management took across the different group settings.

Starting from the administrative nature frame perspective, actors operating within this interpretative frame within this study tended to construct riparian zones as spaces where the effects of human land use on waterways could be addressed (e.g., regional council personnel). This included, for example, the impact of agricultural stock on stream water quality. Usually, the method employed for responding to this interpretation was the establishment of fenced strips alongside waterways (see Environment Canterbury, undated_a). The two statements, cited below, capture this representation of riparian zones as spaces for waterway management:

⁵³ Riparian management has formed part of strategies to address water quality problems in the Barry's Stream and Waitutu studies, to promote the well being of salmonid habitat in the Kemp's Drain and Hague Stream studies, and restore the ecological values of the Waimara Estuary in the Waimara case study.

[they are] are a buffer between some sort of agriculture and the stream itself. The buffer is both physical, in terms of preventing stock from getting into the water; its physical in terms of stopping or slowing down the transfer of nutrients through the top soils through to the river (Interview, Fisheries Manager, December 2002).

Ungrazed, well planted riparian zones act as 'filters' which (sic) settle out sediments for absorption into the soil. Riparian plants use some of the nutrients for growth (Environment Canterbury, undated a).

Amongst the farmer (productive nature-frame) actors, the dominant interpretation of riparian zones was the representation of them as 'part of the farm paddock' (i.e., the farm productive system) (see Table 6.1 for a summary of this sections arguments). Within this image, riparian zones were interpreted based on the positive or negative contribution they made to agricultural productivity. An example of a positive contribution included the access they offered to ready supplies of stock water; a negative, the obstacles they created for stock movement. In the context of these contributions, farmer actions in this study suggest that they, as actors, were most willing to set aside riparian zones as strips when this activity either benefited their farm operations directly or did not impinge adversely upon them. A case-in-point of this comes from the farmer on whose property the Hague Stream initiative was situated. He indicated, in an interview, that he had approved the creation of riparian strips on his farm because of the positive effects generated for stock health, a point indicated in the following comment by him:

It was not good in the winter for the cows to be standing around trying to get into the stream . . . the health of the cows is [with the strip] better . . . carrying dirty water for the cows was not good for their health (Farmer, Hague Stream, December 2002).

Leading on from the above observations, for the above farmer and others interviewed, the setting aside of riparian zones as strips attained a positive image where: (a) the creation of strips took little land out of production; or (b) the creation of a strip achieved positive benefits for a farmer (especially productive). Removing the danger of stock drowning in a waterway was, for example, commonly recited by farmers as a reason for setting aside riparian zones as strips. From this perspective, the essence behind their decision was, as one farmer described it, nothing more than 'good farming practice'. The utilitarian qualities of this interpretation are illustrated

Table 6.1: Interpretative frames, social natures and riparian zones (case study observations)

Plate 6.1: A fenced riparian zone (riparian strip), Barry's Stream (November, 2002).

Plate 6.2: An unfenced riparian zone, lower Waimakariri catchment (South Island) (March, 2001).

Social Nature Themes

Productive frame interpretations (examples)

- riparian zones part of farm productive system
- creation of riparian strips potentially removes land from production
- fenced strips create reservoirs for weeds and pests
- need to be managed, kept tidy

Consumptive frame interpretations (examples)

- riparian strips management tool for addressing impacts of land use on aquatic systems
- zone for promoting indigenous biodiversity
- zone management can provide positive natural goods to instream life (e.g., provide a terrestrial food source)

Administrative frame interpretations (examples)

- creation of strips can help to meet administrative responsibilities for managing water quality
- strips can provide means for meeting other management objectives (e.g., biodiversity goals)
- strip creation provides visual example of 'doing something' to address public environmental concerns

in the comments that a Barry's Stream farmer noted to me in the course of an interview:

It's common sense, just good management doing those sorts of things, regardless of whether you're improving water quality [. . .] fences have been put up for convenience, to prevent stock from falling into the stream more than anything else (Farmer, Barry's Stream, September 2000).

Some farmers also demonstrated consumptive nature frame aspects in their expressions of riparian zone management, several citing the aesthetic value that a fenced riparian zone contributed to their farm. Nevertheless, consistent with the processes described in 6.2, even for such farmers the overriding imperative was that the creation of a riparian strip fit into the productive operation of their farm. This relationship between productive and consumptive concerns is reflected in the following comment made to me by a retired Southland dairy farmer:

Me: What limited you putting aside more riparian strips?

Informant: It was time and money and we were really interested in protecting our farm, our little streams . . . and we still had trouble fitting it in, particularly with dairy farming becoming more and more busy (Retired farmer, Waimara, November 2001).

Amongst some farmer informants, meanwhile, the creation of riparian strips was also imbued with negative meaning; the source of these again appearing to have origins in productive nature frame considerations. The negative imaging of riparian strips most often centred on five themes, these were: (a) concerns about the loss of land from farm production; (b) concerns about the management demands strips created (e.g., control of flood hazards); (c) a sense that with the creation of a strip they were losing control over a portion of their farm; (d) strip areas becoming repositories for 'weeds' and 'pests' that would invade adjacent farm land; and (e) the creation of strips being a step towards greater public involvement in the management of farm land and access to it. The following statements from across my case studies echo these themes:

I have fenced myself out of it [and] I am a wee bit concerned about the weeds I am seeing, especially the Californian thistles, really quite bad . . . But you can see what thistles can do, they seed and contaminate. In a decent wind they would be a source of contamination of farmland (Farmer, Barry's Stream, December 2002).

*Thing is to make sure that the water is not coming over the land; that the stream is kept clean. A couple of times in the last few years the stream has come up and I have said to *** 'look, you have to come and clean it up otherwise we have to put the stock back in' (Farmer, Hague Stream, December 2002).*

[Environment Canterbury] wants to put in plants on both sides. I'm not prepared to do that . . . as a farmer I want to have some sort of access if I need to clean it or do anything to it that needs to assist in, say, drainage of the farm (Farmer, Barry's Stream, December 2002).

Together, the above insights intimate that, for farmers, the interpretation of riparian zones is affected by a distinct set of issues interacting within their nature frames. Appreciating these is necessary for practitioners and theorists of CEM alike, because a farmer for whom a riparian strip retains a positive image was, in the course of this study, more amenable to the creation of riparian strips than those who did not. This has obvious implications for policies that seek to promote riparian management through CEM group activities (e.g. Environment Canterbury, 2003).

As would be anticipated, for the likes of anglers and members of the Waimara Estuary group, consumptive matters have been fundamental to their respective interpretative images of riparian zones and strips (see Table 6.1). Common here has been the anticipation that the creation of fenced riparian strips will benefit the aesthetic, recreational and spiritual qualities of adjacent water bodies. For these actors, a fenced riparian strip carries few of the negatives expressed by farmers, with many of them finding it difficult to identify with the farmer concerns about them, a point demonstrated in the comments of an angler noted below:

Well as far as the dairy interests and the farmers who are involved with that, we really need to have situations where streams are fenced off . . . its just basic stuff, to fence off the streams and having marginal strips and riparian buffer zones along the waterway would go a long way to helping (Angler, June 2001).

Overall, the leading insight from the example of riparian zone social construction is that these areas are not just physical spaces, they are also social entities beset by contrasting - and at times conflicting - interpretations. These interpretations impact on the way these spaces are viewed and managed by those who interact with them (see Table 6.1). In the context of this research, for example, the meaning of riparian zones has extended from being 'a part of the paddock'

(farmer) to 'riverine management zones' (professional resource managers). These interpretations, in turn, have affected the physical activities that different actor groups have interpreted as acceptable or not in these spaces.

A case-in-point from this study has been strategies that different farmers have used to minimise the amount of land 'lost' following their decision (sometimes under duress) to set aside a riparian strip. This has included creating strips of overly narrow width and of fencing only one side of a water-body. Importantly, from a biophysical perspective, these strategies have impacted on the capacity of riparian strips to fulfil some of the physical tasks scientists ascribe to their functions (e.g., Gray, 2000). Many of the strips created by farmers in the Waitutu and Barry's Stream case sites, readings of the scientific literature suggest, would be of insufficient width to filter out high levels of nutrients (e.g., Vought et al., 1995). However, from the perspective of local farmers' nature-frames, the narrow width of these strips has logic, as they have limited the amount of land removed from production and their farms' exposure to burdensome weeds.

The patterns of interpretation and the action described here were, in the course of this research, not restricted to the question of riparian zone management. Similar interpretative processes were apparent, for example, in the way drains and bTB vectors were interpreted and acted towards (Fieldwork April 1999 – December 2002)⁵⁴. From this study's perspective, what is significant about these processes are the implications they have for the way actors involved in CEM initiatives have functioned and acted towards the physical world and the implications of this, in turn, for collective action. What becomes apparent from the example of riparian management is that physical nature is interpreted differently by discrete sets of human actors, with any number of social interpretations (social natures) present in and around such an activity. This situation leads, in turn, to different expectations of how the physical world should be managed. Because of this situation, expectations of community-based riparian projects face a social world that both obstructs and benefits aspects of such programmes. Further, as a result of these processes,

⁵⁴ In a similar vane, scholars such as Scarce (2000) and Castree (1997) have explored and described how, respectively, contrasting constructions of salmon and seals have impacted on the interpretations and subsequent management of these species.

outcomes can emerge that appear nonsensical to one party but logical to another. This situation is complicated further by the political processes and in particular how social natures are promoted through CEM participation. The exploration of this theme now follows.

6.3.3 Social natures and the politics of community environmental management

From a social construction perspective, the notion of politics entails the exploration of the strategies different groups of actors use to assert *their* images of nature (their social natures) over and onto others (see Braun and Wainwright, 2001; Neumann, 1998). Braun and Wainwright (2001) suggest that understanding this is important for three interrelated reasons. Firstly, those who are able to effectively assert their social natures can foreclose on the opportunities others have to manage a resource. Through this outcome, secondly, certain actors can become empowered and able to impose their meanings onto the physical world itself. In the Kemp's Drain study, for example, the dominance of a river engineer 'drainage' image has historically perpetuated the management of the waterway at the expense of angler claims. Thirdly, drawing from the first two points, CEM itself provides *arenas* in which these political processes occur. How these processes are organised and the implications they have for CEM are the focus of this section.

The first finding in this study is that CEM initiatives have provided a *vehicle* through which actors have been able to assert their social natures onto both the political and physical landscape. Numerous farmers interviewed in the Waitutu, Barry's Stream and Maine Valley studies indicated, for example, how participation in their respective CEM groups had provided opportunities to negotiate the retention or promotion of their claims of how the natural environment should be exploited and managed. Comments of farmers from these case studies, set out below, reflect these themes:

The group leaders [Local Initiative groups] do meet with the regional council representatives and Animal Health Board representatives and they present what they are planning to do and we can make recommendations . . . so as a result of all that I think we are a direct contributor and they do listen to us (Member, Maine Valley, July 2001).

People as individuals have different sets of values and different views, and they would try to impose those views in different manners; but because there

is a group here, collectively they can go to, I think we have a reasonable degree of say (Member, Waitutu, October 2001).

Similarly to the above groups, those from the social-oriented initiatives (in which consumptive nature frames were dominant) recognised participation in CEM activities providing similar political opportunities. The following member comments reflect this appreciation:

By creating ourselves we then became part of their communication network, so when they are talking about doing this or that we hear about it because they come and talk to us about it (Member, Waimara, November 2001).

I think it [Kemp's Drain project] probably helped to put the Drain into focus for Fish and Game, who at the time didn't have a very strong interest in the fisheries close to Christchurch (Member, Kemp's Drain, June 2001).

In contemplating political effectiveness, ultimately the most desirable outcome is a situation where one's social nature (i.e., their nature interpretation) is accepted as the legitimate representation of the physical environment (Hannigan, 1995). In such situations, this 'nature' becomes the prevailing representation around which management decisions are based. The achievement of this state is contingent on the ability to assert one's social nature into political fora, while using methods to demote others (e.g., Neumann, 1998; Pfeffer et al., 2001). Within the course of this study, three distinct methods were observed that promoted these ends.

The first of these has involved a process of symbol building and assertion. This is a process where participants across the CEM groups discursively configured their activities in ways that advanced their social nature 'claims'⁵⁵. A sophisticated use of this political strategy was employed by the Waitutu Abstractors Group in a series of meetings held in 2001 to discuss the future management of the area's water bodies⁵⁶. What I subsequently discerned at the meetings I attended was an on-going effort by the group's representatives to configure the physical work that its members had undertaken into symbols that were politically advantageous to the group's claims

⁵⁵ The notion of 'nature claims' is derived from Hannigan (1995), who has argued that before a social interpretation of nature is accepted as a legitimate representation of reality, it must negotiate its way through a 'claims making process'. Prior to doing so, any group's assertions have the status of a claim, which exist alongside a myriad of other competing claims of nature's 'reality'. Hannigan's (1995) argument is most often used to describe how certain environmental claims become accepted as 'problems' by society.

⁵⁶ These meetings related to the drafting a statutory water plan for the water resources of the Canterbury region.

over local water resources. The main form this took was the argument that these projects (e.g., riparian strip creation) signified expressions of the stewardship qualities of local farmers as waterway managers. Following on from this, these symbols were invoked in arguments of why they, the local water users, should be given greater control over the management of Waitutu's surface water bodies. Attached to this was also the claim that because the work of the group had, they suggested, 'improved' the condition of Waitutu's waterways, farmers should be allowed to remove more water from them. Underscoring this was the logic that the effects of this activity would be balanced by the positive changes in local aquatic condition achieved through the actions of the groups.

These arguments and the symbolic positioning of the group represents an innovative *interpretative turn*, especially in the context of concurrent claims (e.g., by anglers and fisheries managers) that it was farming activities that posed the greatest risk to the streams (I observed these claims being expressed at the very same meetings as those referred to above). Subsequent events suggest that through the strategy described above, the Waitutu Abstractors Group achieved a more prominent position for its nature claims over those of others, including the claim of farmers for more access to water. What I found ironic about this process is that it had been the pressure of these other claimants (e.g., the local Fish and Game council) that had pressured farmers to instigate the projects, which, in 2001, were symbolically configured to usurp their very nature claims.

While these developments have not seen the Waitutu group achieve absolute dominance for its social natures, by ascribing certain symbolic value to their restoration work local farmers have achieved a political position they would otherwise not have obtained. Further, they have been able to take the environmental 'higher ground' away from the instream conservation parties by framing themselves as the 'natural guardians' of the local water systems. Interestingly, however, this has occurred despite recent observations that these systems remain degraded in terms of certain water quality parameters and despite the work of the group (see Chapter Four, Box 4.1). This indicates that the political claims the group has made about its restoration work have not matched up to the present state of the physical

environment. As an outcome, this is significant because it demonstrates how political success in promoting an image of nature may not, in a material sense, relate to the biophysical conditions actors claim to exist or to have created.

A second strategy for managing the political position of one's social natures was observed being employed by the Barry's Stream Care group. The method employed by this organisation involved the limiting of outside parties involvement in the group (e.g., anglers who fish the stream). Through this method, actors whose social nature claims potentially conflict with their own were denied a voice on the CEM group. This subsequently gave group members a degree of control over events and the opportunity to maximise the opportunity for advancing their own nature interpretations through the CEM organisation (Fieldwork, July 1999 - February 2003).

The third and final political process emerged from the relationships between agencies and the respective CEM groups. Drawing on the notion of 'enrolment' from actor network theory, my argument is that organisations like Environment Canterbury and Southland, and the Animal Health Board, have employed a diverse range of techniques to *enrol* other actors into CEM activities that supported their (the authorities) social nature claims⁵⁷. Insights arising from the relationship between Environment Canterbury, and the Barry's Stream and Waitutu groups can be used to explore the dynamics and effects of this process⁵⁸. In the relationship between these two parties, four distinct enrolment tools were employed by Environment Canterbury to - in the language of actor network theory - draw members into this authority's 'actor world' (of nature).

The first of these I term *expressions of empathy*. This technique involved Environment Canterbury, as an organisation, expressing a public understanding of the difficult situation faced by the members of these groups in managing their effects

⁵⁷ Actor network theory is a branch of social construction that addresses the notion of reality as an outcome of processes of social negotiation (Demeritt, 1998). Enrolment is part of the negotiation process and arises as actors are brought (enrolled) into the visions of reality held by other actors (Callon, 1986; Latour, 1987).

⁵⁸ The fact that this process occurs alongside the two I have already described highlights the highly politicised nature of CEM activities. Further, although these two examples are both of productive-oriented groups, the efforts at political assertion were observed to be equally relevant to the social-oriented groups.

on the environment. As part of this empathy, it declared a willingness to assist the likes of farmers with information and tools to help ameliorate the pressures faced by them. The information and tools offered tended, in turn, to draw farmers into activities *consistent* with Environment Canterbury's social nature interests, as the tools supplied have encouraged and reinforced certain behaviour. For example, the provision of funds for setting aside riparian zones into strips has inevitably encouraged this activity to occur. The following abstract from one of Environment Canterbury's pamphlets reflects the language of the *empathy* tool.

"Sick of being criticised?" [Bold, large font]

Help is on the way . . . [in text]

A checklist which (sic) will allow you to highlight the positive environmental practices on your farm and identify areas where improvements could be made is currently being developed. Environment Canterbury's resource care section is heading the initiative . . . (Environment Canterbury, 2001 a).

The second enrolment tool used by Environment Canterbury has been *awareness raising*. As a tool, this has involved attempts by the organisation's staff to make farmers conscious of the impacts that their activities can have on the physical environment (e.g., the effect of stock on waterways). One physical apparatus used in this process has been a water-monitoring device known as a clarity tube (see Plate 6.3); this is a metre long glass cylinder that demonstrates the levels of sediment in a water sample. In the course of this inquiry I observed staff using these tubes and the data they gather to demonstrate to Barry's Stream and Waitutu residents the levels of silt in their local waterways. With the tubes and the data they have yielded, Environment Canterbury has sought to promote a different order and form of material reality to stream-side residents. This is one in which the presence of silt in a stream is understood as an environmental problem. Selman and Wragg (1999) call objects (such as clarity tubes) that perform this function, *interessement devices*.

The third enrolment tool Environment Canterbury has used involves what I term *strategies of immersion*. These are procedures that enrol an actor into others' social natures by having them undertake activities that are consistent with them. In this study, immersion was promoted through the use of environment grant schemes. In Environment Canterbury's case, these have operated through its *Environment*

Enhancement Fund, a subsidised grant scheme whereby projects that meet criteria set by the Council receive a subsidy for their completion (Environment Canterbury, undated b). In meeting the criteria set down by the Fund, applicants agreed to undertake projects that comply with the nature view of the funding agent, an outcome that invariably sees them acting consistently with Environment Canterbury's social interpretations of nature. This includes, in the Fund's case, the promotion of regional biodiversity, an interest not necessarily at the forefront of traditional farmer/biophysical concerns in the Barry's Stream and Waitutu catchments (see Environment Canterbury, undated b).

Plate 6.3: Environment Canterbury staff using a *clarity tube* (red arrow) to demonstrate the presence of suspended silt in a North Canterbury waterway (Source: Environment Canterbury, 2003, p. 3).

The final enrolment tool Environment Canterbury has utilised is, like the empathy method, designed to build a personal relationship that enhances farmer complicity with the authority's social natures. I call such methods '*modes of celebration*', and they have entailed the publicising of the efforts and the perceived successes of groups that have been supported by Environment Canterbury. Behind this method is the anticipation that the recognition given to the group's efforts will encourage members to continue with their work, while encouraging others to follow their examples and initiate or become involved in similar voluntary enterprises. Both the Waitutu and Barry's Stream groups have been 'celebrated' in Environment Canterbury publications, an example of which is supplied below:

*"The clear, spring-fed streams south of * * * are special features of the district . . . [the group's] work has significantly reduced the sediment levels in Barry's Stream and stream life is improving"* ([emphasis in original] Environment Canterbury, 2003).

Collectively, the enrolment strategies utilised by Environment Canterbury represent a subtle, yet pervasive, method for drawing Barry's Stream and Waitutu farmers into activities not necessarily consistent with their social natures. A key consequence of this method, for the Council, has been that it has proved less confrontational than the more traditional techniques of regulations at achieving farmer change (see Bristow, 2000)⁵⁹. As a matter of caution, some qualification on the success of the enrolment process is necessary.

Observations from this research suggest, for example, that amongst the farmers interviewed, none emerged as having been fully immersed into the regional council's 'nature world'. This is not surprising, as to do so would be inconsistent with both the productive imperatives that face a farmer and the norms, social rules and structures that contribute to their nature interpretations and actions. Therefore, from the context of those interviewed and observed, enrolment can be said to have been partially successful only. Given this, it would be incorrect to say that CEM activities in the Waitutu and Barry's Stream catchments are the consequence of farmers re-interpreting their representations of nature as the result of enrolment.

Instead, in many cases, they appear to have been pragmatic responses to tensions in the local political/social environment. Important here has been the wish to maintain control over their historic resource relationships, by being seen to 'do the right thing', even if they do not entirely agree with what this is. This highlights what I discern as a key tension in the situation facing a number of the informants from the productive-centred groups (Interview transcript, November 2001). This is a tension wherein they are required to balance their own social natures with the interests of other nature interpretations. This necessity of balancing one's interactions with the environment between different social natures is reflected in the following comments of Barry's Stream farmer:

I think perhaps with all this talk about, perhaps even pressure from these groups, Fish and Game and ECan [Environment Canterbury] I think that perhaps we are starting to see it in a different light, but as a farmer you do sort of see it for the practical purpose for which it is there [the stream] . . .

⁵⁹ The Animal Health Board's Local Initiative Programme, with its aid to farmers for vector control, also features enrolment as an attribute. For example, through the direction of funding - to vector control - the scheme has explicitly promoted the importance of vector eradication in bTB management to participating farmers.

well I guess I wouldn't have probably fenced that [stream margin] if there hadn't been the pressure there to do it (Farmer, Barry's Stream, December 2002).

In the following section, I draw on the preceding insights to return to the objectives at the centre of this study.

6.4 Chapter Insights: Re-visiting the Objectives of this Study

6.4.1 Form and function of community environmental management

Upon synthesising the insights from the proceeding sections, I discern two expressions of the form and function of CEM; one of which is actor-oriented, while the other is broader and politically oriented.

The first of these, the actor-oriented expression, characterises CEM as involving associations of actors who share similar interpretations of nature (social natures), and who act collectively to represent and assert these (see Figure 6.3). I term this the 'vehicle' model of CEM, whereby the opportunities created by organising into a group leads to an institutional vehicle for the promotion of particular actor groups' social natures. The process of representation and assertion, meanwhile, has two aspects to it. The first is the notion of groups asserting their social natures onto the material world; the second is the assertion of these natures onto the political landscape.

The second image is more extensive in terms of its parameters. The image here is of CEM as an institutional *arena* in which any number of actor groups compete or collaborate in an arena of action, where the focus is to achieve legitimacy for their social natures. In the order of things, one can say that the vehicle image of CEM features organisations that *sit inside* these arenas (see Figure 6.3).

The contrast between these two images of CEM can be understood by using the example of the situation revolving around the operation of the Maine Valley CEM group. In this example, farmers who have participated in the Local Initiative group have been able to achieve more than physically impose their meanings onto the local landscape; they have also been able to challenge the vector image of the

Animal Health Board. In this sense, the group has provided a vehicle for the accomplishment of this. Alternatively, from the Board's perspective, the scheme has provided an arena in which it has been able to promote the enrolment of farmers into a programme that asserts its social nature claims. Concurrently, across the three social-based studies, participants have been able to draw on the opportunities created by the presence of the CEM organisations they have been involved in to assert their social natures onto the physical and political landscapes of Waimara, Kemp's Drain and Hague Stream respectively. In the Waimara case study, this has included the physical re-configuring of an estuary wetland margin into an image reflective of members' social natures (see Plate 4.12).

Figure 6.3 summarises the characteristics of each of the CEM images described above. In this diagram, the location of the 'vehicle' image inside the 'arena' example signifies the capacity for any number of actor groups to use the opportunities created by the presence of a CEM programme to further their social nature interests. From these notions of CEM's form and function, I now move to the consideration of the performance of the six CEM groups in this study, drawing on themes yielded from the preceding analysis.

Figure 6.3: The twin social construction images of community environmental management

6.4.2 Group performances: A social construction of nature appraisal of effectiveness

The question of whether the groups in this study have performed effectively from a social construction of nature perspective requires, firstly, an understanding of what 'effectiveness' means from this theoretical perspective. Insights from the preceding sections suggest that there are two factors that need to be considered here. The first of these is the degree to which a CEM initiative has allowed different actor groups to assert their social natures onto the physical world. The second part, is the question of to what degree these processes have allowed actor groups to assert these same natures over and upon those of other human actors. In addressing both of these questions there is a need to be aware that the replies to each will be contingent upon the perspective of the actors examined. They therefore need to be distinguished from each other and respectively described. An assessment grounded on these variables now follows for each of the six case studies, with the insights from this exercise summarised in Table 6.2. Key aspects of the table include its recognition that different meaning-holders (horizontal rows) see the outputs of CEM differently, while these outputs themselves can be divided into the physical and human parts I describe above. The exploration of effectiveness begins with the Maine Valley group.

a. Maine Valley Local Initiative Programme group

Farmers from Maine Valley, participating in the Local Initiative Programme group, have been able to give effect to their image of the bTB vector issue (see Table 6.2). In particular, the opportunity to focus their efforts on the trapping of ferrets appears to have been a significant factor in compelling Valley farmers to support the programme. In contrast, if the scheme had required a specific focus on possums, insights from this chapter suggest that their participation and support of the programme would have been reduced. From a political perspective, meanwhile, farmers have been able to use the Board's programme to ensure that, in terms of local action, the ferret construction has been at the forefront of vector control operations. Valley farmers have not been so effective in having this influence extend through to affect the Animal Health Board or the Regional Animal Health Committee's vector interpretation. For both, the possum remains at the centre of their

Table 6.2: Social construction of nature and effectiveness: Case study insights

CEM Sites	Effectiveness Variables	Prominent actor groups and their nature frames		
		Productive-oriented	Administrative-oriented	Social-oriented
Maine Valley	Assert meanings onto the physical world	Group members: Able to physically act positively towards vector construction	Animal Health Board: Farmers trapping vectors consistent with Board's image of vector issues	
	Assert meanings onto other human actors	Able to assert meaning within Valley but not beyond	Partial enrolment of farmers into actor world
Waitutu catchments	Assert meanings onto the physical world	Group Members: Maintained resource use relationships with waterways	Environment Canterbury: Assertion through Resource Care section activities	Anglers Assertion through advocacy channels (e.g. resource consents)
	Assert meanings onto other human actors	Symbolic use of projects to assert control over local resources	Partial enrolment of farmers into actor world	Sponsorship of social natures by Environment Canterbury
Kemp's Drain	Assert meanings onto the physical world	Local Farmers Management has historically supported nature view, but changing	Environment Canterbury Statutory dominant role, hegemonic control over landscape	Group Members: Limited imposition of meaning onto landscape
	Assert meanings onto other human actors	Meanings under challenge from changing rural political ecology	Management position allowed domination of administrative natures	Limited, but fore-runner to wider interpretative change
Barry's Stream	Assert meanings onto the physical world	Group Members: Maintained resource use relationships with stream	Environment Canterbury Assertion through Resource Care section activities	Anglers Assertion through advocacy channels (e.g. resource consents)
	Assert meanings onto other human actors	Assertion through physical exclusion of outside meaning-holders from group	Partial enrolment of farmers into actor world	Sponsorship of social natures by Environment Canterbury
Hague Stream	Assert meanings onto the physical world	Local Farmer: Group activities compliment his nature view	Fish & Game Council: Not seeking to directly impose meaning onto Hague Stream landscape	Group Members: Imposition of meanings onto Hague Stream landscape
	Assert meanings onto other human actors	Near absolute control via virtue of property rights	Member meanings not imposed on Council directly as consequence of project	Initiatives required to complement farm-production policy
Waimara Estuary	Assert meanings onto the physical world	Farmers: Historic dominant control over landscape	Environment Southland: Assertion through Land Sustainability section activities	Group Members: Able to impose meanings onto land that own, limited capacity beyond this
	Assert meanings onto other human actors	Historic domination threatened by changing rural political ecology	Partial enrolment of group members into actor world	Limited by social structures, norms and property rights

'vector' image. In this context, the Board's 'possum' image has proved highly resistant to challenge, even against rising levels of contrary experiential knowledge gathered by farmers. The dynamics of this situation was summarised to me by Morgan Williams, former Landcare Research scientist, when he noted:

That's a really interesting example of the tension between what a community understands as the nature of the problem and the risks, and what the agencies and conventional science does [the possum : ferret vector question] . . . I convened the first big workshop on that at Hawdon Station and it turned into an extraordinary battle between the farmer knowledge base . . . and the veterinary animal health view [which] was diametrically opposed and simply wouldn't believe our data . . . ten years on there is still all these doubting questions around what the anecdotal evidence has continued to show without a bit of doubt, that bloody ferrets are in the bloody middle of the transmission story (Morgan Williams, February 2003).

From the Animal Health Board's perspective, the Local Initiative scheme, as a nation-wide policy initiative, has allowed it to ease some of the tensions arising from the interpretative differences described above. It has precipitated this by providing an institutional space for local-level interpretations of nature (e.g., the ferret image in Maine Valley), giving farmers a vehicle for acting positively on their vector interpretative images. In this role, it has eased some of the political pressures that the Board would have faced from farmer discontent if this opportunity had not been provided.

b. Barry's Stream Care and Waitutu Abstractors groups

Assessing the Barry's Stream and Waitutu studies, observations suggest that each of these CEM groups has been effective in allowing a defined set of resource users (primarily farmers) to manage the pressures of other social nature claims over the waterways they use (see Table 6.2). The collective action observed in these groups has, to an extent, transpired because the members of each share a common interpretative view of the waterways they respectively interact with. This is one in which these systems are regarded as resources to be exploited or controlled for the productive well being of themselves and their neighbours. These images are squarely premised on productive concerns.

Subsequent efforts to organise and act collectively within each group have been encouraged, further, by the sense that outside groups (e.g., anglers) threaten

local claims over these water systems. Underpinning this has been the call, by some of these external actors, that farming practices are degrading the Barry's Stream and Waitutu systems, and that these should therefore be managed in ways that ameliorate such effects (see e.g., Langlands, 2001). In response to these assertions, by applying certain political methods, as noted earlier, the members of these groups have been able to moderate the impacts of these outside claimants on their relationships with the respective waterways.

Concurrently Environment Canterbury, through a series of enrolment methods, has been able to input its administrative nature frame concerns into the relationships local farmers share with each of these waterways. The subtleties of this technique have proved, regional council staff believe, to have been more effective in achieving change than traditional methods premised on regulation. This point is noted in the comments of a regional council employee, reproduced below from my interviews:

The easiest approach is to write a rule in a plan and then go around enforcing it. That's the easiest way. But I don't think you get the results . . . I think you get better results, far longer-term results, if we work with those communities (Environment Canterbury, Resource Care employee, November 2001).

As noted earlier, some qualification is necessary about the degree of interpretative/physical change achieved through Environment Canterbury's enrolment strategies. Indications are, in the language of actor network theory, that 'translation' (that is the acceptance of alternative meanings into other actors' interpretative 'worlds' [see Callon, 1986]) has been partial across these two studies. The difficulties facing attempts to enrol farmers into alternative social natures are ably demonstrated by the example of drain management, an example that I have previously described as relevant to both cases⁶⁰.

⁶⁰ In this instance, despite regional council attempts to have farmers recognise the adverse effects traditional cleaning practices can have on drain systems, these practices have only changed slowly from their historic form. Underpinning this has been a prevailing image, amongst many farmers, that the effects of drain cleaning are an accepted part of the 'environment'. Normative and structural factors, meanwhile, have made the adoption of an alternative image of drains difficult (e.g., one in which they're consumptive as well as productive values are recognised and managed for). These include, for example, local by-laws that require annual or biennial cleaning of these systems.

In both case studies, the position of outside actor groups, notably anglers and the North Canterbury Fish and Game Council have been, in a political sense, marginalised by the claims making strategies invoked by these groups (especially the Waitutu case). The symbolic framing of group work in the Waitutu catchment, as noted, has been used to challenge the claims that farmers are having an adverse effect on the local water systems. In the case of the Barry's Stream group, meanwhile, exclusion from the care group has reduced the opportunities for anglers and the Fish and Game Council to 'have a say' in the management of this stream. The willingness of the regional council to encapsulate some of the nature claims of these 'outside' parties within its enrolment activities has, however, tempered the effect of these strategies. This has ensured some amount of assertion of these groups' social natures in the community management of the Waitutu and Barry's Stream waterways⁶¹.

c. Kemp's Drain Trout Unlimited project

The anglers involved in the Kemp's Drain initiative encountered considerable difficulty in their attempts to impose their social nature meanings onto the physical landscape of this waterway (see Table 6.2). The group was physically constrained, for example, in where its members were allowed to plant shrubs, and what work was permissible in the channel of the drain. This control conflicted, in turn, with the nature image of restoration that many of the participants brought to the project, a point highlighted in the comment of a member reproduced from my interviews, below:

I always felt we actually had to get in the drain a little bit more and play with the structure of the drain with boulders; you know, making pools and things like that. I always felt that was going to be more important if you really wanted to improve it as a waterway (Member, Kemp's Drain, October 2001).

Behind this resistance to angler claims was the historic interpretation of regional council engineers, for whom the waterway was socially constructed as a physical structure for the removal of water. This image, at the time of the Trout Unlimited project, proved to be an 'interpretative obstacle' to angler efforts to re-configure the

⁶¹ One reason this has occurred is because of statutory requirements in the Resource Management Act to consider consumptive interests (e.g., intrinsic and amenity values). In the past, when such imperatives were not explicit within the prevailing environmental legalisation, the consideration of such concerns tended to give way to productive interests (see McDowall, 1994).

Drain's landscape to reflect their consumptive-nature views. This view included a less lineal channel structure and more riparian cover immediately adjacent to the flowing portions of the Drain (Interview, June – October 2001).

Although the initiative appears to have had limited success in transforming the Drain's landscape, it does appear to have been a forerunner to interpretative change. Some participants and regional council staff, for example, consider that the project was at the forefront of a process whereby regional engineers have become increasingly sensitive to alternative social nature claims on local waterways. This point is iterated in the two observations cited below, one from a river engineer, the other from a Kemp's Drain group member:

[there has been] an evolution that was driven by people identifying particular ecological enhancement potential in various rivers and drains, and I think that it is generally an awakening of interest, of the public, to the potential of these waterways . . . so I see that shift from that straight engineering to what you might call environmental engineering, as a sort of evolutionary thing that occurred with a particular interest of the public (Environment Canterbury river engineer, January 2003).

. . . we did raise awareness of the drain with some of the staff at the regional council and one or two of the councillors as well (Member, Kemp's Drain Initiative, June 2001).

One should be wary, however, of over-emphasising the role of the Trout Unlimited initiative in these changes. Wider institutional developments, most notably the management imperatives set down within the Resource Management Act, together with wider public appreciation of the Drain's ecological values, have played a significant part in this interpretative shift. Thus, collectively, this combination of factors appears to have contributed to a 'softening' of the historical river engineer image of the Drain, a point iterated in the comments of an Environment Canterbury river engineer, below:

The Resource Management Act arrived and required a wider perspective, although I think that was happening anyhow, with peoples' particular interests in the Drain and trying to achieve outcomes other than those flooding and drainage ones, along the lines of ecological improvement (Environment Canterbury river engineer, January 2003).

This wider interpretative appreciation, however, has not extended across all actor groups, most notably the local farming population, who have traditionally

valued the Drain for its drainage and irrigation supply functions. One noteworthy episode demonstrates this point. In February 2001 a popular television programme, *The Holmes Show*, featured a segment documenting claims by anglers that dairy farming activities were causing damage to Canterbury's waterways. One portion of this item featured a farmer arguing, alongside the Drain, with a staff member from the local Fish and Game Council⁶². At one point in this discussion, in which the farmer was being challenged about the impact his stock were having on the waterway, he rebuffed the staff-member's claims with the pronouncement: *what bloody fish? There are no fish in here!* In the parlance of the insights from this chapter, this claim may, from the farmer's perspective, have been genuine. This is despite the physical reality of there having been consistently high trout stocks in the Drain (see Chapter 4, Figure 4.3).

To understand this farmer's statement, one needs to re-visit points from the previous sections. These suggest an actor committed to productive interpretations of nature (the farmer) would be less likely to 'see fish' or a waterway as a 'fish habitat', because such 'things' are not consistent with what he or she sees when they literally look at a waterway. The farmer's claims can therefore be understood, not as a flippant remark, but as the product of an interpretation produced within a distinct nature frame. Furthermore, in the case of this individual and others farming along the Drain, such interpretations have proved very resistant to change⁶³.

d. Hague Stream Enhancement Initiative

Insights from the Hague Stream initiative suggest that this organisation has been very effective in imposing its meanings on to the physical landscape of the Hague catchment (see Table 6.2). Plate 4.10 demonstrates, for example, the fenced riparian strips that have been part of this imposition process (others have included channel alteration). Instrumental in the accomplishment of this, has been the complicity of the catchment landowner, a farmer, who has allowed the work to proceed. Beneath this co-operation has been processes by which aspects of the farmer's nature view have aligned with that of the community group. Underscoring

⁶² A case of research meeting vocation, the Fish and Game staff-member was myself (see Chapter One, Section 1.4).

⁶³ For supportive comparative research, in New Zealand see Cocklin et al. (2000), and overseas see McHenry (1994; 1998).

this has been elements of the farmer's productive outlook, which has included the recognition of the value of clean water to his farm and stock; and consumptive factors, particularly his personal appreciation of the aesthetic qualities of an enhanced stream. Aspects of this latter appreciation are reflected in his comments, below:

I enjoy very well the fish coming in and the plantings; they make the farm nice (pause); nice to work on, those kinds of things (Farmer, Hague Stream, December 2002).

Concurrently, as previously described, there is an expectation by this actor that these 'improvements' should complement rather than hinder his farm's productive operation. In cases where they conflict, as noted by him below, then the purpose of a project must cede to productive considerations:

*"I said to * * * [the group's leader] 'you can do what you want but don't interfere later on if we take water for drinking water . . . I don't want to see what they are doing interfering with my farm policy'" (Farmer, Hague Stream, December 2002).*

The sentiments expressed by the farmer, above, help in the understanding of the interpretative processes at work in and around the Hague Stream project. Foremost, it signifies the on-going prominence of productive-frame considerations in what is and is not allowed to occur in the Hague catchment. Underpinning this has been a system of *de jure* and *de facto* property rights that reside with the farmer (as land owner) and make it structurally difficult for other actors to transform the physical environment of the stream beyond images acceptable to him (McCallum and Memon, 2002). The fact that the Hague Stream group has been able to achieve the changes they have, in turn, has been because of the complicity that has arisen between their own and his social natures.

e. Waimara Estuary Care group

The Waimara Estuary Care group has, within the aspirations and resources of its membership, been partially effective in imposing the social nature concerns of its members onto the material and political spaces of Waimara (see Table 6.2). The group's flagship wetland restoration project (see Plate 4.12), for example, physically and symbolically represents a departure from the present dominant patterns of land use in Waimara (uses that reflect strong productive underpinnings). As an

institutional body, Waimara Estuary Care has also created opportunities for the articulation of its members' meanings within various fora addressing the management of the estuary. The extent to which it has been able to dominate in these proceedings has, however, thus far been small in terms of the overall management of the estuary (Donald Ross pers. comm., March 2003).

One reason for this is that the group, for normative and resource reasons, has deliberately chosen to restrict its assertion efforts (physical and political) to: (a) its own property (i.e., its wetland project); and (b) to projects that do not directly threaten the position of the dominant actors (e.g., farmers) in the estuary catchment⁶⁴. Because it has operated within these boundaries, the group has limited the degree to which it has sought to impose its social natures onto the physical and political landscape of Waimara. This quality of the group was aptly summarised to me by an agency representative:

They are not really (pause), there is only a few of them [members] that will likely put their hand up to say 'hey we want to try and improve things further up the catchment by challenging those people and trying to take them on' . . . but they are really not in the mode of taking people on further up the catchment (Agency representative, January 2003).

While this characteristic does represent a limit to the group's capacity to be effective, it can also be appreciated as a rational response to the social and political environment it operates in. Several points are worthy of note here. These include the dominance of productive interests in the Waimara catchment and the supporting norms and social structures that sustain these (Fieldwork, November 2001). Although I did not interview any farmers from the Waimara area, the landscape itself speaks of the historic dominance of their nature frames. Signs of this include the intricate patterns of drains, tide gates and stop-banks that maintain lands, once wetlands but now farm paddocks, free of water⁶⁵. Local by-laws, meanwhile, help to sustain these physical structures, decreeing the maintenance of drains – as in the Waitutu and Barry's Stream studies – a legal responsibility of landholders. One can also surmise from the patterns in the Waitutu and Barry's Stream case studies that the same

⁶⁴ Examples of such projects have included an 'estuary day', a publicity event held in February 2001.

⁶⁵ For historic references to the assertion of productive values in the Waimara landscape see Miller (1975) and Hall-Jones (1945).

normative pressures exist on landholders to maintain these. Within this context, it is not surprising that the group has not sought to assert itself beyond the boundaries it has operated within. To do so would be to risk the backlash and social censure of the dominant actor groups in Waimara (if they were to feel threatened by the group's activities). The capacity for this to occur and the effects it can have on CEM participants were recounted to me by Donald Ross (New Zealand Landcare Trust) and his description of events associated with another Southland CEM group:

*Yeah they [Waimara Estuary Care members] have got to live in the community, you don't have to go far away to the * * * group, where two women in particular took the local community on through the landcare group . . . they were running planting programmes along the river and water quality monitoring and all the rest and they have been ostracised; they have been voted off the school board. . . and these two women, they feel hugely aggrieved. You know 'why did this happen? Here we are trying to do our very very best for the environment and we have been dropped kicked!' (Donald Ross, New Zealand Landcare Trust, March 2003)⁶⁶.*

I now proceed to the final objective theme, the question of the implications of this chapter's insights for theory.

6.4.3 Theory: The social construction of nature and environmental management

The term 'nature' is universally recognised as one of the most complex words in the English language (Williams, 1985). In the context of this chapter's analysis, this complexity arises, partially at least, from contested notions of what passes for nature and how it should be managed. Observations in this study indicate that this is more than a semiotic process, for actors whose definitions are accepted as legitimate are in a position to impose their social nature onto others, both human and non-human (cf. Hull et al., 2001; Proctor and Pincelt, 1996). Because of this, there is a need for 'interpretative flexibility' in the way CEM is understood, which extends to the ways that 'environment' and 'management' themselves are defined. Extending this outlook to issues of theory, two prominent theoretical arguments arise that are worthy of further analysis. I explore these under the headings of: (a) interpretations of environment and management; and (b) notions of the human actor and action.

⁶⁶ To understand why this occurred, observations on social norms and rules from the preceding chapter would, I believe, offer one avenue of explanation.

a. Theoretical interpretations of environment and management

Examining the likes of the common property institute and community narratives, it is apparent that the normative descriptions of 'environment' and 'management' that attach to them suggest that both are stable and objective entities. As such, these images disguise the interpretative and political processes highlighted in this chapter, and in doing so contribute to what Li (2002, p. 279) describes as a "political economy of ignorance and complacency". To avoid this situation, Drinkwater (1992) suggests that theorists must be attune to the relative and interpretative origins of terms such as 'environment' and 'management'. How this can be done and the implications for CEM theory are considered below.

Commencing with the notion of 'environment', if one is prepared (for operational reasons) to equate 'nature' to the non-human side of the concept of environment (i.e., physical processes and organisms), then we open up the term to the themes raised in this chapter. Drawing on these, it can be argued that the environmental qualities of CEM have a social as well as physical dimension. By this, I suggest that 'environment' has two realities: one of these being material (i.e., what exists physically); the other being a social construct (i.e., the social interpretation of this physical reality). The acknowledgement of this second social reality is important because, as Macnaghten and Urry (1998) argue, it is this one that people determine their actions towards the physical environment by. For example, wetlands are conceived and acted towards by Waimara group members on the basis of how they socially construct them.

Noting the presence of two realities of nature is also significant because of where it locates this argument within the metaphysical continuum between idealism and realism. What it does, specifically, is resist the ontological extremism of arch-idealism, which argues for a nature inseparable from human consciousness (e.g., Woolgaar, 1988). Instead, the expression created is a pluralist notion of nature; that is, a state where there is a *physical nature and any number of social ones*. Concurrently, physical nature is not a neutral entity in the social construction processes I have described; for although its part is non-purposive, non-human 'actors' contribute to the process of nature's social construction. A case-in-point is the way

that the biological receptiveness of ferrets to bTB has, as a physical attribute of this animal, contributed to the (vector) representation they hold amongst Maine Valley farmers.

Like the notion of environment, notions of ‘management’ within CEM narratives, such as the participatory and common property institute approaches, carry images that disguise the role that power and interpretation play in environmental administration. Instead, the normative image of management is commonly that of an objective process, which entails efforts to have people and the physical environment behave in prescribed ways. In this view, conflicts over management are often presented as technical disputes rather than, as observations in this research suggest, conflicts over meaning. What is missing from such descriptions, therefore, are portrayals of the interpretative and political processes raised in this chapter. An appreciation of these suggests that there is a need, when considering management issues, to ask questions about *whose* interpretations are catered for through efforts to manage the environment? How do these interpretations fare in the management process? And what are the implications for the physical environment as a consequence of this? Asking these questions is consistent with the two alternative images of CEM summarised in Section 6.4.1 (i.e., the *vehicle* and *arena* images), as both imply the presence of actions where management has social and strategic qualities linked to them.

In closing this discussion, it is necessary to appreciate that any interpretations underpinning notions of ‘environment’ or ‘management’ will be relevant to a time, space and a particular set of actors. When these change, so too may the meanings they hold. The way the management of Kemp’s Drain has changed over the last fifteen years is a case in point (temporal context), as is the contrasting appreciation of ferrets between farmers in Maine Valley and those on the coast of northern Canterbury (spatial context). This tendency towards unstable and relative notions of environment and management is, again, at variance to the normative images usually portrayed in the narratives describing CEM (the *new social movement* narrative being an exception given its emphasis on peoples’ efforts to give effect to their identities – see Chapter Two). I will now draw on the points raised in this section, as well as the preceding

analysis in Chapter Five on meaning, to explore the opportunities that this analysis provides for re-visiting the image of the actor and action within CEM.

b. Re-theorising the human actor and action

The emphasis on the unit of 'community' within the prominent narrative descriptions of CEM appears to have occurred, theoretically speaking, at the expense of a deeper understanding of the human actor and action. Within the participatory narrative, for example, notions of grass roots development frequently ignore the complexity of social relations at the local level of society (e.g., Bernard and Young, 1997). Amongst those narratives that do specify a role for the individual, this image and that of their actions is sometimes overly simple. The common property institute narrative, for example, is premised on the narrow understanding of the human actor as a rational economic being. Missing from this image, as Mosse (1997) argues, is recognition of the role that social interpretative processes and structural impediments play in shaping human behaviour.

The findings from this and the preceding chapter support a model of the human actor and action that is both broader and more active than these images. This includes the recognition that people, as farmers have in the Waitutu case study, respond to each other, other humans and the physical environment in ways that are reflexive, meaningful and strategic. This is a view consistent with the notion of an actor-oriented world. Long (1989, p. 223) ably summarises the qualities of the human actor captured by this image, when he states:

[S]ocial actors are 'knowledgeable' and 'capable'. They attempt to solve problems, learn how to intervene in the flow of social events around them, and monitor continuously their own actions, observing how others react to their behaviour and taking note of various and contingent circumstances.

But if we treat the human actor in this way, the question becomes what determines their actions? Are people, for example, acting of their free-will (human agency)? Or are the meanings they respond to shaped by the determining powers of social structure? The findings from Chapter Five on the micro processes of trust and its relationship to meaning, and the discussion of nature frame processes (6.3 and 6.4) from this chapter, indicate that elements of both human agency and social structure

are involved in the determination of human action. Further, as also noted, the physical environment itself can play an actor role in defining human action towards it. Given this, there is an impetus for reconciling all three factors into a framework that provides valid understandings of human action within a CEM / social action construction context. Efforts to do so follow below and in Chapter Eight (see Section 8.2).

In the past, attempts to draft models to accommodate the factors described here have included the work of Giddens (1984), whose efforts to reconcile human agency and social structure lie at the heart of his theory of structuration. Adding to the theoretical developments of Giddens, observations from this study prompt the need to also consider the role of the environment as an 'actor' in the construction of social (nature) reality and human action. When this is done, the resulting model is one in which the actions of an actor are instilled by the interactive elements of agency, structure and the physical environment. Putting this into the context of a human actor from this study, we can take the example of the farmer who owns the property on which Hague Stream is located. This actor has managed his relationship with the waterway, this study intimates, to reflect his social nature interpretations. Underscoring this process has been an appreciation of the waterway's aesthetic qualities (an attribute of human agency), the imperatives of economic production (economic aspects of social structure) and the fact that because salmon spawn in the stream, this waterway has additional meaning for him. All of this, of course, is linked specifically to a space (the stream) and a time (1998-2002).

Drawing these two arguments together locates the actor and their (meaningful) activities into an interactionist, actor-oriented model. Within this, physical and social systems are themselves reproduced and transformed through the medium of meaningful action (Jones, 1999). An instance that demonstrates these qualities from this study, is the way that riparian zones have been interpreted, learnt about and recreated through processes of social construction, symbol management and enrolment. Figure 6.3 summarises this relationship schematically. In this diagram the linkages between agency, structure and the physical environment to the human actor and their actions are highlighted. The double-headed nature of the arrows

involved, meanwhile, demonstrates the capacity for all four elements to be reproduced or transformed through the interactions between them. The way the enrolment methods of Environment Canterbury have assisted in altering the response of farmers to riparian zones in the Waitutu and Barry's Stream areas is illustrative of this effect. The notion of contextual relativity, meanwhile, is represented by the inward and outward arrows that intersect through the dotted space/time circle.

Figure 6.4: An interactionist model of the human actor and action within community environmental management organisations – case study insights

6.5 Conclusions: How and why is the social construction of nature important to community environmental management?

In concluding, I describe how and why the findings in this chapter are important to the understanding and development of CEM. As a summary observation, the findings from this chapter highlight the necessity for a fresh appreciation of the role that social variables play in human environmental practices. In the past, within traditional 'command and control' approaches, the emphasis has been on methods that have portrayed nature as something 'out there', awaiting the hands of human managers (for example, Ministry for the Environment, 1996). The insights from my case study research challenge this image and suggest, instead, one where nature has *both* a physical and social dimension. The latter of these, in addition, being noteworthy for its unstable and relative character.

As a number of theorists have described, the failure to recognise and manage for the social dimensions of nature have confounded attempts to develop effective environmental policy (e.g., Paulson, 1998; Proctor and Pincelt, 1996). The reasons for this are multiple and include, firstly, the tendency it has created for the reification of images of nature, which have disguised their human authorship. This, in turn, has obscured the ideological and political dimensions of environmental policy, which has subsequently stifled the opportunity to evaluate collective action and what passes as environmental 'knowledge' (see Jasanoff, 1990; Neumann, 1998). Further, it has encouraged the implementation of policies that have, at times, been ill suited to the contexts (social and physical) in which they have been applied. The relevance of a central North Island bTB vector image to the dry foothill country of the South Island being a case-in-point.

Translating these effects to this study, I have already described how the elements of nature interpretation have contributed to uncertainty, conflict and competition amongst the actor groups investigated in this study. A case-in-point is how different social interpretations of nature contribute to conflict between an angler and a local farmer in the Barry's Stream case study. Looking at these effects in a broader context, one can argue that the failure to either recognise or manage for the

social dimensions of nature contributes to a 'black box' within policy approaches, in which the processes I have described in this and the preceding chapter are obscured.

In contrast to such situations, applying a social construction of nature lens provides a means for 'opening up' this box (or illuminating it). In doing so it intimates a dynamism and richness in the policy experience, with roots that transcend deep into the worlds of human social experience and local context. This is able to occur, because as Irwin (2001, p. 183) sagely describes it:

Once we step outside the conventional assumption that the social and the natural can exist independently of one another, fresh opportunities emerge for constructing new relations and more productive forms of dialogue and interaction.

At an institutional level, what the above argument points to is the need for programmes that avoid deference to abstract notions of the environment. At the operational level, meanwhile, this suggests that the secret to improving the efficacy of CEM does not involve incremental adjustments to management methods. Rather, it emphasises the inevitability of context and the embeddedness of CEM within processes that are – partially at least – socio-cultural (Macnaghten and Urry, 1998). From this perspective, such things as the Maine Valley farmers' representation of ferrets is not relegated to the level of perception, but is understood to offer an avenue for exploring the complexities of farmer/biophysical relationships in a spatial and temporal locality. This 'fresh look' also extends across to notions of environmental politics. Many understandings of this have traditionally focused on a Weberian model of power, where the focus is on how different groups might act *on* CEM groups or the physical environment to achieve pre-determined ends (e.g., Ritchie, 1996). In contrast, observations from this chapter (using the social construction lens) alert the analyst to how discursive strategies and enrolment processes result in power being exercised *through* CEM.

By bringing these points together, one can argue that the social construction of nature lens provides the dual benefits of: (a) a tool for making sense of the world; and (b) a defence against reification by alerting society to the practice of nature's social construction. In generating these benefits, the lens creates opportunities – within

CEM and other policy methods – for reflexive and democratic engagement. This arises because when environmental issues are *not* rendered down to issues of technical disputes or human ignorance, openings are created for deeper and context specific dialogue between actors. An aspect of this is the opportunity this can subsequently provide for the symmetrical treatment of social natures, which may lead to the identification of opportunities for co-operation and collective action. What may transpire from this situation, in turn, is the capacity for greater understanding and informed intervention by, for example, agency staff.

By way of a concluding comment, the analysis in this chapter suggests that the notion of community environmental management entails processes that are as much social as they are physical. This intimates, as research by Kortelainen (1999) has identified, that social adjustments at the local level may be as significant for promoting desirable environmental action as international agendas premised on such criteria as sustainability. Moving on from these observations, it is the themes of sustainability that form the third and final exploratory lens of this study in the next chapter.

Chapter Seven:

Findings Three: Sustainability and Community Environmental Management

"In the 1990s 'community-based' approaches to environment and development have become de rigueur. With the environment firmly on international development agendas, and in the wake of the United Nations Conference on Environment and Development (UNCED), there is an emerging global consensus that the implementation of what has come to be known as 'sustainable development' should be based on local-level solutions derived from community initiatives" (Leach et al., 1997b p. 1., emphasis in original).

7.1 Introduction

The post-1980s focus on CEM has corresponded with an interest in its capacity to contribute to states of sustainability (e.g. Leach et al., 1997b [above]). Given this linkage, it appears appropriate to use sustainability as a further lens for the critical exploration of CEM, with the insights from this process being used to re-visit the objectives of this study. Before this, however, a broad introduction to sustainability theory is necessary and follows below.

7.1.1 Sustainability: Theoretical approaches

Since the late 1980s, the notion of sustainability and its variant forms⁶⁷ has captured the imagination of numerous decision-makers and environmental planners (e.g., Parliamentary Commissioner for the Environment [PCE], 2002). In popular terms, this interest can be traced to the publication of the World Commission on Environment and Development (WCED) report, *Our Common Future*, in 1987. However, present-day expressions of sustainability have origins that extend back further and embrace the mounting realisation of environmental limits to human growth (in the early 1970s), the theorisation of different pathways for human development that evolved from this concern

⁶⁷ These include the concepts of 'sustainable development' and 'sustainable management'. In contrast to the notion of sustainability, it is appropriate to consider each of these as different interpretations of pathways to sustainability.

concern (e.g., the rise of concepts such as eco-development) and numerous strategies designed to implement these pathways (e.g., the World Conservation Strategy, 1980) (see Adams, 1990; Dixon and Fallon, 1989). In New Zealand itself, meanwhile, sustainability has come to prominence, partially, through its central position in the country's umbrella environmental legislation, the Resource Management Act (Memon, 1993).

At a literal level, the meaning of sustainability is derived from the Latin term *sustenere*, which means to 'keep elevated' (Nelson, 1995). In operational terms, what this means has been the subject of considerable debate⁶⁸, and while no consensus exists over its practical definition, several re-occurring themes arise within expressions of the term. These are: (a) a preference for multi-dimensional approaches considering ecological, economic and socio-cultural aspects at an equivalent level; (b) a need to appreciate the temporal and spatial scales over which human interactions with the physical environment occur; (c) management for uncertainty by acting with caution in the use and development of natural resources; and (d) a focus on approaches to resource use that are conscious of the functions and interactions of human-biophysical life, and the cumulative and synergistic effects of these interactions (Diesendorf and Hamilton, 1997; Folke et al., 1998; Glasby, 2000; Grundy, 1993; Sneddon et al., 2002).

The operationalising of these themes has concentrated on what has been described as the 'three pillars', 'the triple bottom line' or the 'triangle' of sustainability (e.g., Munasinghe and McNeely, 1993; PCE, 2002; Yencken and Wilkinson, 2000). The central theme across these images is that the achievement of states of sustainability is dependent on processes and outcomes across three aspects of the human-biophysical world - that is the biophysical, social and economic (see Figure 7.1). Exploring these in detail, under the biophysical heading the normative requirements for sustainability are argued to require the protection of the life-supporting capacity of resource systems through, for example, attention to the maintenance of the stability and resilience of

⁶⁸ See Adams (1990), Grundy (1993), Macnaghten and Urry (1998), and Redclift (1987).

ecosystems (Common, 1995). Attention is also given here to strategies that deal with uncertainty (e.g., the precautionary principle) and the synergistic effects of human actions on the biophysical world (Grundy, 1993). Under the category of economics, attention is given to patterns of consumption that uphold the reproductive capacity of renewable resources, and that minimise the level and effects of externalities from these uses (Jacobs, 1991). The economic aspects of sustainability are also attentive to the promotion of efficiency and equity in resource use patterns (Daly and Cobb, 1990). The socio-cultural portion of sustainability emphasises the interactive importance of such variables as participation, equity (inter- and intra-generational) and security (domestic and international) (Mitchell, 1997; Warburton, 1998; WCED, 1987). The relationship between these variables and the aforementioned themes is summarised in Figure 7.1. This figure highlights the interconnectedness of these central variables, while also demonstrating their embeddedness within temporal and spatial settings.

Figure 7.1: The triangle of sustainability (Source: Adapted from Munasinghe and McNeely (1995, p. 25))

Note: An expanded discussion of the sustainability variables presented above follows in the proceeding sections (i.e., 7.2 – 7.4).

It is the contention in this study that the themes captured in Figure 7.1 embrace what, in effect, are the normative commitments that underpin the ideal of sustainability (e.g., WCED, 1987). Beyond this framework, however, what sustainability entails becomes increasingly contentious. This is a quality identified in the following comment of Sneddon et al. (2002, p. 669):

Both 'sustainable development' and 'sustainability' are normative concepts, describing visions of the ways in which human activities and ecological processes might be reconciled for the 'good' of both. Yet there is often more than one vision of how to obtain the reconsideration, and such visions may be intensely contradictory.

The uncertainty echoed in the above comment raises questions for the methods designed to promote sustainability. Unsurprisingly, a key question commonly asked of these arrangements is how they provide for the accomplishment of the variables set-out in Figure 7.1 (e.g., Auty and Brown, 1997). Nevertheless, despite the centrality of sustainability within a number of CEM narratives (see Figure 2.1), the critical exploration of the relationship between it and CEM has been limited. Those studies that have been undertaken, meanwhile, have demonstrated that, in terms of the normative conditions described in Figure 7.1, these are frequently not realised within particular expressions of CEM (e.g., Kellert et al., 2000; Wainwright and Wehrmeyer, 1998). Such observations, along with the lack of a body of critical research, make the exploration of the sustainability - CEM relationship especially relevant to this study and its goal.

7.1.2 Presentation of analysis

The following analysis sets out to describe and inspect the implications that a series of inductively derived arguments have for the CEM - sustainability relationship. Further, it goes on to explore what these arguments suggest as issues for the dominant narrative expressions of CEM, which I described in Chapter Two (see Figure 2.1). These arguments fall under the three sections of the sustainability triangle and are:

- *Biophysical*
 - the issue of social expectation versus human-biophysical capacity

- the issue of scale
- *Socio-cultural*
 - matters pertaining to participation and equity
- *Economics*
 - the dilemma of the 'internalisation' argument
 - 'production first' dilemma

A schematic summary of how the analysis proceeds is set out in Figure 7.2. As it illustrates, the respective argument points that emerge from the analysis are used to assess the performance of my six CEM case studies and to develop a set of inductive conclusions about the relationship between CEM and sustainability.

Figure 7.2: Presentation of analysis – schematic

7.2 Biophysical Sustainability and Community Environmental Management

7.2.1 Background

The notion of biophysical sustainability is difficult to define concisely, but at its centre lies the notion of balance between the life supporting capacity of ecosystems and the satisfaction of the instrumental and intrinsic needs of humans (Adams, 1990). Attempts to operationalise this theme have concentrated upon ensuring that the long-term state and resilience patterns of ecosystems are maintained in the face of anthropocentric change (see Common, 1995; Grundy, 1993). From an institutional perspective, CEM has been advanced as a means for delivering this goal (e.g., Berkes, 1989), although a number of recent studies have questioned the tangible contributions

that the approach has made to biophysical sustainability (e.g., Kellert et al., 2000). In the context of this dialogue, the exploration and inspection of my six case studies emphasise two points of analytical note. I paraphrase these as: (a) the notion of social expectation versus biophysical capacity; and (b) the issue of scale.

7.2.2 Social expectation versus biophysical capacity

In the absence of clear understanding and perfect knowledge about natural systems, Holling (1995) argues that people resort to socially derived expectations to shape their aspirations for environmental management. In the course of this research, this was made explicit in the description of the social construction processes described in Chapter Six. A derivative of this process, observed in this research, was the tendency of CEM participants to express a self-belief that their efforts would or should engender certain biophysical outcomes. On inspection, what was revealed is that differences arose in the course of group activity between the socially defined expectations of participants and the physical capacities of the environments they were dealing with. To appreciate the logic and implications of this, two examples from this study are set out below. In these I describe what the respective groups - the Hague Stream and Waimara case studies - set out to accomplish and compare these with observations about the state of the systems they sought to accomplish these goals in. I then explore what the processes yielded in this comparative study suggest about the relationship between these CEM arrangements and biophysical sustainability.

The activities of the Hague Stream group have concentrated on enhancing the capacity of the waterway (i.e., Hague Stream) to contribute salmon to the Rakaia River fishery. To accomplish this, the group focused its attention on the creation and enhancement of spawning habitat in Hague Stream (see Plate 4.10). Underscoring this effort was the social interpretation that the waterway offered what would be, with enhancement, ideal salmon spawning habitat. This expectation is illustrated schematically in Figure 7.3, with the line defined as *A* depicting what the group sought to achieve in terms of a biophysical state for the Rakaia salmon fishery (the notion of 'states' is defined below). In assessing the validity of this expectation, arguments within

Figure 7.3: Hague Stream group: Capacity, expectations and outcomes

Note: Trends summarised on the graph represent schematic representations of processes rather than literal replication of data

salmon research literature (e.g., Unwin et al., 1999) and comments of a local fisheries manager indicate that the biophysical capacities of the stream and the salmon fishery did not align with these expectations. One contention, for example, is that anadromous salmon populations in New Zealand are limited by marine rather than freshwater variables (Unwin et al., 1999). More specifically, an argument about Hague Stream itself, from a local fisheries manager, suggests that the waterway lacks the physical condition and location to make any additional contribution to the Rakaia's salmon fishery from that of its historic past. His argument is summarised in two points below:

. . . the trick is not how many spawn in there or how many come back, but how many of the eggs hatch and grow to a size where they are big enough to enter the river and then into the ocean . . . once they emerge [salmon fry] they need under cut banks, basically Hague Stream to me looks to be a bit of a long drainage ditch. Your typical spawning stream is highly meandered, has little sets of pools and riffles. [. . .] I don't know if it is a behavioural thing that fish are not ready to go into a spawning stream when they are that far down, but there are not really many examples of big spawning streams in what you would call the middle reaches, so that may be a difficulty with it [Hague Stream] as well (Fisheries Manager, December 2002).

What these respective arguments suggest, is that the biophysical state of Hague Stream and the Rakaia salmon fishery (depicted as line B, Figure 7.3) operates at a level

of variation that is inconsistent with the expectations of the group (line *A*). This is represented in Figure 7.3 by the physical space between the two lines, while the minimal physical outcome of the initiative, in terms of net contribution to the Rakaia salmon fishery (measured in terms of returning spawning salmon, see Figure 4.5) is depicted by line *C*.

Behind the differences depicted in this argument lie a tension within fisheries science about the questionable merits of single-species/single age class habitat restoration work (see Rosgen and Fittante, 1986). Underscoring this has been the emergent scientific recognition that focusing on one aspect of fisheries habitat, such as spawning habitat in the Hague Stream situation, does not represent the panacea for improving the overall adult population in a river system. Research in biological restoration has demonstrated that a ‘whole environment’ (the emphasis here has been biophysical) approach needs to be adopted when seeking to improve, for example, adult salmonid populations (Hicks and Reeves, 1993). This has precipitated calls for more comprehensive approaches to habitat restoration, based on broader understandings and appreciations of watershed processes (Naiman et al., 1992). This includes, in the context of the fish communities, not just organising activities around the enhancement of a single species or age-class (e.g., adult spawning salmon). In the instance of Hague Stream, these arguments have a relevance that I will return to after considering the Waimara Estuary Care group case.

Participants interviewed from the Waimara Estuary Care group expressed a desire for an improvement in the Estuary, which bettered its condition from that of its state in 2001. Often, this was described to me in terms of returning the Estuary to a notion of what it was a ‘100 years ago’ in terms of, for example water quality and biotic life. The following comments from a Waimara group member reflect this aspiration:

Well I would like to see that everything is back to what it used to be maybe 100 years ago. Clear, freshwaters everywhere and lots of persons who can fish for pippies; healthy environment for fish and whitebait and whatever (Member, Waimara, November 2001).

Once more I have illustrated these aspirations, this time in Figure 7.4, where line *A* is again used to depict the biophysical improvements that the members aspired for the estuary through their CEM involvement. In contrast to this, the current biophysical tendencies within the estuary (for water quality and biotic life) are summarised in line *B*. The lower relative position of this line reflects observations from data (e.g., Environment Southland, 2000) and my inspection of the estuary's catchment. These sources suggest that the biophysical state of the estuary has deteriorated from its condition in the past⁶⁹ and those efforts to return it to something akin to this condition face a present-day biological and human environment that would resist this objective. Thus while it is valid to argue that the Waimara Estuary Care group would have achieved some changes at the periphery of the biophysical and human environment (depicted by line *C* in Figure 7.4), these are well short of the normative goals of the group depicted in line *A*.

Figure 7.4: Waimara Estuary Care: Capacity, expectations and outcomes

Note: Trends summarised on the graph represent schematic representations of processes rather than literal replication of data

⁶⁹ Data collected by Environment Southland (2000) indicate, for example, that the overall water quality of the estuary has declined markedly since monitoring began, as shown in the faecal coliform figures reproduced in Table 4.7. My own observations, meanwhile, revealed that land uses around the estuary had changed the landscape significantly from that which first greeted European settlers. This will have changed the biotic life of the estuary considerably from its historic past, a proposition upheld by the study of similar environments elsewhere in New Zealand (e.g., Park, 1995).

Central to understanding the difficulties facing such efforts, not only in this study but the five others, is an appreciation of the current system dynamics that underscore the present-day state of the Estuary's human-biophysical environment. Within conventional arguments about ecosystem dynamics, it is argued that systems operate in certain *states* of natural variation (lines *B* in the preceding figures) (Common, 1995). Such states are characterised by the tendency to be resilient in the face of natural and anthropocentric change⁷⁰ (Meffe et al., 2002). In contrast, it can be argued that what members of the Hague Stream and Waimara groups have sought is a re-organisation of their respective focus biophysical systems into new (Hague Stream) or past (Waimara Estuary) states. These states, significantly, are not consistent with the present day human-biophysical characteristics of these systems. For example, returning Waimara Estuary to a condition similar to its state in the early twentieth century would require considerable adjustment to the farming practices in the catchment of the Estuary. One can anticipate, as events elsewhere in New Zealand have demonstrated, that institutional and personal resistance to such a strategy would be considerable (see Pawson and Brooking, 2002). Similarly, levels of heavy metals that have accumulated in the Estuary (as a consequence of decades of storm-water discharges) would require management strategies that are well beyond the present capacity of this group to rectify. Thus, in terms of the variable of water quality, returning the Estuary to pre-1903 levels of hydro-carbons is probably impossible within its resources.

In a similar way, for the Hague Stream group, indications are that to improve adult salmon numbers in the Rakaia system (the overall objective of the group) requires more than creating spawning habitat in a single stream. It requires, as Hicks and Reeves (1993) have argued, consideration of all the human and biological variables that impact on the maturation processes of chinook salmon populations. At the core of this

⁷⁰ There are two fundamental theories of ecosystem organisation within ecology, the 'balance' and the 'flux' of nature perspectives. The 'balance of nature' approach dominated explanations of ecosystem organisation up to the 1970s and is grounded within an equilibrium notion of ecology, which focuses on notions of stable climax communities. System resilience, in this approach, is construed to entail the ability of ecosystems to return to their climax state after disturbance. In contrast, the 'flux of nature' approach, which has garnered support since the 1970s, emphasises the dynamic and non-equilibrium tendencies within physical systems. Within this model, resilience is defined as the capacity of a system to maintain its character after a perturbation (Meffe et al., 2002).

understanding is the 'bottle-neck' model of biological production⁷¹ (Bjornn and Reiser, 1991), which suggests that systems are limited by certain key variables that conspire to restrict the number of adults in a population. In turn, research of east coast river fisheries in the South Island of New Zealand suggest that spawning habitat *is not* a bottle necking factor at present (see Unwin et al., 1999). This indicates that to accomplish the group's goal of increased net adult salmon numbers there are other variables it should concentrate on to achieve this. In this sense, the physical improvements in the spawning environment of Hague Stream (an undeniable *output* of the project) and the links of this to 'more [adult] salmon in the river' are limited.

Moving to explain the dynamics between capacity, expectations and outcomes, depicted in Figures 7.3 and 7.4, three further points of relevance and qualification are necessary. The first is an appreciation that the differences revealed above are not endemic to CEM alone, but can affect other management approaches. As an issue, for example, it has pre-occupied the field of restoration ecology, where the opportunities for rehabilitating systems has needed to be qualified against the present biophysical and human situations within different environmental settings (e.g. Eden et al., 2000)⁷². What makes the likes of the Hague Stream and Waimara groups especially susceptible to the problem, however, are qualities of the social and political processes that underscore these groups and which I have previously described in Chapters Five and Six.

One such effect is the recognition that issues of environmental management are as much matters of power and politics as they are issues of biophysical administration (Chapter Six). Because of this, information on the capacity of ecosystems has, as discerned in this study, often been ignored when it has not complied with the nature claims of a group. For example, the Hague Stream group was observed to discount the scientific claims of the local Fish and Game council about the capacity of its activities to

⁷¹ For the sake of this argument I am suggesting that this model can be extended to embrace human elements as well.

⁷² The work of Schaeffer (1997) on shallow lake ecology is an example of research in this area. His research has highlighted how it may be impossible to restore the clarity and turbidity levels of shallow lake systems back to past conditions following certain change events. The present-day condition of Lake Ellesmere/Te Waihora is a case-in-point of this situation (Prystupa, 1998).

improve the salmon population levels in the Rakaia River. Such strategies lead to a self-fulfilling world, whereby the only biophysical information accepted by participants as 'true' is that which complies with their expectations⁷³. This can be a two-way process however, as observations from the Maine Valley case study show. I have already highlighted, for example, how scientists from the Animal Health Board were observed to have discounted the experiential claims of farmers over the vector role of the ferret, when these contradict their own interpretations of the bTB / vector relationship (Morgan Williams, pers. comm., February 2003).

The second point is that the system tendency lines depicted by *B*. (Figures 7.3 and 7.4) also have attached to them a range of distinct social meanings, economic expectations, and social and political rules. Any attempt to re-organise an ecosystem into a new state, therefore, involves not only an effort to re-organise a biophysical system, but also the human elements that have evolved and become dependent on its existing tendencies. For example, an attempt to improve native fish habitat in the Waimara Estuary by removing tide gates⁷⁴, would not only represent an attempt to change the physical infrastructure that upholds the biophysical state created by their presence; it would also represent a challenge to the social and economic conditions that have evolved around and support the presence of these gates (e.g., local by-laws). Recognition of this tendency suggests that it is more correct to consider the two *B* lines as representations of human-biophysical states, rather than ones that are purely biophysical.

The third point is, with the presence of line *C*, particularly in the Waimara case, it is recognised that some positive change *in terms of the normative aspirations of the participants* has been achieved. Further, if one was to change the normative expectations of, for example the Hague Stream group, to that of protecting the instream physical

⁷³ This is a feature of many of the historic arguments that certain recreational groups make about the stocking of waters with sports fish species in New Zealand (see McDowall, 1994). Further, it is a situation that has led to considerable frustration amongst fisheries scientists and managers, who cannot understand why their scientific studies are ignored or criticised by pro-stocking parties.

⁷⁴ Tide gates are a device that aid land drainage by preventing incoming tidewater from moving up waterways where they are placed.

environment of this waterway, then they could be said to have been very effective (see Plate 4.10). In this sense, neither project represented a diversion or fruitless exercise in biophysical restoration. Nevertheless, these examples do highlight a need for a ‘reality check’ in terms of what is anticipated of, and what can be expected from, community-based initiatives.

It is also prudent here to consider, fourthly, what implications these insights have and how they are, in turn, informed by observations from the other four case studies. As the graphic information in Chapter Four illustrates (see Figures 4.2, 4.3, 4.4 and Box 4.1) the other four groups appear to have achieved biophysical outcomes consistent with their normative goals (Waitutu less so, as the details in Box 4.1 suggest). As described in Chapter Three, issues of attribution mean one must be wary about the establishment of any direct causality between the changes observed in these studies and the work of their members. Nevertheless, on a speculative basis the relative consistency between goals and changes imply that some causality exists. This tends to suggest that in ecological terms, in returning these systems to a recent state (e.g., clearer water in Barry’s Stream) these groups have been dealing with system perturbations, that is fluxes in their character, rather than wholesale adjustments in their physical and human states. Because of this, it has been relatively easier for these groups to accomplish their biophysical goals. I seek to illustrate this process in Figure 7.5.

Figure 7.5: Community environmental management within biophysical states – the Barry’s Stream example

In Figure 7.5, the example of water clarity change in Barry's Stream can be used to illustrate how the other four groups in this study have been more effective in meeting their normative biophysical objectives than the Hague Stream and Waimara cases. In the figure, the problem of water clarity change is represented by the downward arrow (see Figure 4.4 for comparison). This change can be characterised as a downward perturbation relative to the prevailing tendency of the waterway; although it does not represent, as subsequent patterns in the figure suggest, a re-organisation to a new biophysical state. The subsequent efforts to redress this perturbation through CEM activities, such as riparian management, are represented by line *B*. It can be seen that as a result of the actions symbolised by this line, Barry's Stream returns to the relative stability of its pre-perturbation state (i.e., line *A*). The tendencies captured within this figure may also be used to help explain the biophysical outcomes observed in the Waitutu, Kemp's Drain and Maine Valley studies.

The contrasting processes of state tendencies, perturbation versus system re-organisation and the biophysical-human dimensions of systems highlight the complex world that promoting biophysical sustainability through CEM faces. In the next section another factor that further complicates this, the matter of scale, is considered.

7.2.3 Scale considerations and biophysical sustainability

Scale - defined here as the level at which environmental issues are conceptualised and managed - is a central issue within resource management (Bissonette, 1997; Sneddon et al., 2002). Despite this significance, the argument I posit here is that scale matters are accommodated in a limited fashion by the examples of CEM that premise this inquiry. Further, I argue that this has affected the capacity of these organisations to generate sustainable biophysical outcomes. Confirmation that scale issues tended not to be accommodated for comes from the example of the planning and implementation strategies associated with five of my case studies (the Maine Valley initiative is the exception here).

Exploring these case studies, two leading observations of the way scale matters were managed was observed. The first of these has been the narrow spatial scale the five organisations have operated within, relative to the biophysical goals they have set for themselves. An example of this is the Kemp's Drain group, who sought to improve the brown trout fishery of the Drain generally, while only focusing their activities on a small spatial portion of this waterway and on a narrow set of restoration activities (i.e., primarily riparian planting). Similar scale tendencies were observed in the Waitutu and Waimara case studies, both groups concentrating on a limited number of restoration activities and on a scale that did not reflect the physical extent of the problem they were seeking to address.

The second point has to do with the variables considered by the groups in the organisation of their activities. It was common across the five groups, for example, to focus on changes they could make to the physical environment, while giving limited recognition to other scalar variables such as social and institutional factors. Again, invoking the Kemp's Drain example, this group focused its efforts on changing the physical environment of the Drain, but gave little attention to the social and political factors that also impact on the condition of the waterway's trout fishery. They did not, for example, extend the scale of their operations to include seeking changes to the way that productive activities in the Kemp's Drain catchment affect its fishery. The importance of these scale considerations was commented on in the reflections of a participant:

All we really did was endeavour to improve one small section . . . and perhaps create some habitat for trout. But there were a lot of other factors that were totally out of our control that maybe should have been addressed before that project got going. [. . .] Unless you have control of the whole drain and you can keep stock out, it is pointless doing a section of planting and looking after only one section of it (Member, Kemp's Drain, October 2001).

In interpreting the above patterns of behaviour, two factors offer explanation as to why they arose. The first point is grounded in the spatial frame that farmers, the leading actors within the productive-oriented groups, invoke to 'look upon' the world.

Observations in this study suggest that this focus was primarily directed at what was occurring on their farms: I term this, the 'my farm view'. Farmers that I interviewed were themselves well aware of this scalar tendency, as inferred in the comments below:

I mean I think a farmer knows his own little patch but he's not aware of what's happening at the different points up the stream (Farmer, Barry's Stream, July 2000).

But most people probably only know about the bit they live on . . . you know it was quite a surprise to find it was that bad [the lower parts of the stream], it was really shocking really (Farmer, Barry's Stream, July 2000).

Ritchie (1998) suggests that this pattern has its origins in farmer considerations of privacy and private property rights. The set of rural norms and rules I set out in Chapter Five, meanwhile, can also be anticipated to contribute to this scale outlook (Interviews, June 2001).

From a management perspective, the 'my farm view' generates numerous difficulties for resource managers seeking to work through community-based groups to accomplish environmental outcomes. This was apparent, for example, in the efforts by Environment Canterbury staff to use community-based initiatives to manage the contributions farmers make to the non-point pollution of rural waterways. The 'my farm view' made this issue difficult to deal with because, usually, the contribution of non-point pollutants from an individual farm were small, while the sum of cumulative effects from several farms, as in the Barry's Stream study, was severe. What Environment Canterbury staff recounted to me was that they had found it subsequently awkward to convince farmers that there was an environmental problem, because the water entering and leaving each individual property seemed to be unchanged. What this example highlights is the spatial affect that the 'my farm view' can give rise to for the management of a particular environmental issue. An employee of the authority recounted the difficulties created by this view to me:

. . . the sedimentation is what is really doing the damage and unfortunately, where it is frequently occurring is in the upper reaches where it is faster moving water and its carrying it away without the people,

who are probably contributing to it, really being unaware that they are creating a problem (Employee, Environment Canterbury, August 2001).

Secondly, it is apparent from the survey of the capacity of all of the groups in this study that none, alone, has had the ability to meet the resource demands generated by the depth and level of scale issues facing their management objectives. An example of this emerges in the recognition that the Waimara group has lacked the institutional power to enforce compliance, for example, of activities that protect the estuary environment beyond its reserve. Overseas, such situations have been negotiated through by the employment of integrated management approaches, which have nested CEM arrangements within wider strategies for the administration of particular environmental issues. Examples include numerous waterway partnership groups in the United States, which have received support at both the federal and district level (e.g., Coughlin et al., 1999). Surprisingly, despite the supposed comprehensive nature of New Zealand's own umbrella environmental legislation, the Resource Management Act, the development of similar integrated programmes has been limited⁷⁵ (see Hughey, 2001).

In the Canterbury and Southland regions, as elsewhere in New Zealand, an effect of this has been the tendency for CEM initiatives to develop as 'stand alone' responses to perceived environmental problems (the Barry's Stream, Kemp's Drain and Hague Stream are instances from this study). Because of this, there has often not been an institutional structure that has assisted groups in surmounting the scale variables their initiatives face (i.e., biophysical, social and institutional). In contrast, the Maine Valley initiative, nested within the auspices of a strategy administered and supported by the Animal Health Board, illustrates the benefits that an integrated institutional structure can supply in regards to the management of scale issues (see 7.2.3).

Returning to the issue of biophysical sustainability, three implications for CEM are raised by these observations. Firstly, it is apparent from these insights that scale

⁷⁵ One example of an exception included the Motukea integrated catchment initiative, located to the west of Nelson in the catchment of the Motukea River (see Brasher, 2003).

issues can impact on the capacity of groups to achieve their biophysical goals. This is because community groups, in terms of their resource capacity, are typically limited in their ability to address all the processes that impact on the systems they are seeking to manage. These include, for example, the cross boundary movements of contaminants, and institutional processes that encourage or support actions inconsistent with their objectives.

An effect of this, secondly, is to increase the level of uncertainty faced by community initiatives. At the centre of this issue is the appreciation that the less comprehensive a groups' understanding is of the events around it, the less ability its members will have of anticipating potential adverse developments (Gunderson and Holling, 2002). A suitable metaphor here is that the more a person can take in and the further they can see, the more conscious they will be of what is approaching them.

Thirdly, the limited management of scale variables reduces the capacity of groups to anticipate synergistic affects that social and political processes can have on the biophysical environment. An instance of such an affect from this study was how the demise of collaborative pest control in the North Canterbury region precipitated the rise of rabbit numbers in Maine Valley, which in turn encouraged the rise of ferret numbers and with this the number of these animals capable of spreading bTB⁷⁶. In contrast, as work by Meredith (1999) and Pritchard and Sanderson (2002) has demonstrated, programmes that can address a range of scale issues enhance opportunities for certainty and predictability. This, they argue, improves the capacity for programmes to provide outcomes that are biophysically sustainable. In contrast, the scale frames of the groups in this investigation (with the exception of the Maine Valley case), appear to have been insufficient to provide this service. In the Maine Valley case the nesting of this initiative within a wider bTB vector control strategy saw a number of the physical / spatial scale issues facing the goals of the group being addressed; an example being the concurrent

⁷⁶ Surveying the narratives of my informants, vector-born bTB only became an issue in the Valley in the mid-1990s, while the organisations that formally resided over rabbit control in the area were dissolved in the early 1990s.

control of vectors outside of the Valley that could have, if left uncontrolled, re-infested the Valley.

7.2.4 Community environmental management and biophysical sustainability - analysis

The findings of this study yield two criteria for the analysis of the relationship between CEM and biophysical sustainability. These are: (a) the notion of balance between a group's expectations and the capacities of human-biophysical systems; and (b) the degree to which CEM initiatives integrate and use scales that reflect the dimensions of the issues they are addressing.

Examining the processes associated with the six CEM groups, indications are that the performance against these two criteria was mixed. All but two of the groups, for example, appear to have been working within strategies that were consistent with the human-biophysical states of which they were a part. In contrast, performance against the scale variable, with the exception of the Maine Valley group, was poor. Looking at the first criterion, trends observed indicate that the Hague Stream and Waimara groups sought outcomes that did not match the prevailing human-biophysical states of the systems they wished to change (see Figures 7.3 and 7.4). The other four groups, in contrast, appear to have been working towards outcomes consistent with the state of their relevant environments. Evidence for this claim comes from the observation that the systems these groups sought to influence did - biophysically at least - change in ways consistent with their physical goals.

For example, as Figure 4.4 indicates, the levels of sediment in Barry's Stream have decreased over the period that the associated stream care group has functioned; this represents a change consistent with the overall normative objectives ascribed to this group by a number of stakeholders (e.g., anglers and regional council staff). This suggests that the physical issues being addressed in these systems were cases of system perturbations rather than instances of re-organisation. In this context, therefore, management has assisted in returning a system to its pre-flux state (see Figure 7.5).

In terms of the scale criterion, the Maine Valley group, with its support from the Animal Health Board, was the only initiative that operated within a scale that encompassed a number of the dimensions for the problem they were seeking to address. The Barry's Stream and Waitutu initiatives did, meanwhile, cover large proportions of their respective systems, but still did not accommodate all relevant aspects of catchment activity. Similarly, their accommodation of social and institutional scale factors was limited. The Hague Stream group - in terms of the Rakaia River salmon fishery - and the Kemp's Drain group - in terms of the Kemp's Drain brown trout fishery - only extended their scalar influence over minute physical portions of these systems. Notably, also, the inclusion of social and institutional scalar aspects in their management efforts was poor. The same overall conclusions can be drawn about the activities of the Waimara group.

When analysing the performance against these criteria, the first issue to consider is the complexity of accommodating for the nuances of environmental issues generally (see, Mitchell, 1997). Environmental problems have been characterised as 'wicked', because of the levels of uncertainty and unpredictability attached to the physical behaviour of natural systems that humans seek to manage (Bardwell, 1991). Insights from this study, for example, indicate that addressing an issue seemingly as straightforward as vector control faces numerous issues that are difficult to overcome. These include, for instance, social contest over the status of different 'vector' animals (Fieldwork, June 2000 - August 2001).

Beyond the character of environmental problems, two specific points arise that require analytical inspection. The first of these is rooted in the dual relationship at work in the first of the criteria, which is the 'expectation / system capacity' criterion. My argument here is that the tendency, as in the Hague Stream and Waimara case studies, for groups to set expectations inconsistent with biophysical capacity is rooted in the aforementioned processes of social interpretation (see Chapter Six). As Eden et al. (2000) argues the expectations held by the members of these groups are mediated products of human and biophysical interaction, although these are seldom recognised by

people. Underpinning this failure, Latour⁷⁷ (1993) argues, is the problem of *purification*. This is a process whereby people act towards the world as if a distinction should be drawn between the physical and the social. In contrast, Latour (1993) suggests that society should appreciate the hybrid origins (i.e., human-biophysical) of environmental management. Further, he argues that society needs to bring hybrids 'to light' so that people can understand themselves and things, such as the environment, with improved clarity (see also Haraway, 1991). In terms of the processes I have summarised across Figures 7.3 – 7.5, one can anticipate that the 'opening up' of the hybrid nature of biophysical management would provide the opportunity for assessing and evaluating group objectives against the material tendencies of the environment.

While Latour's notion of hybrid 'emancipation' appears valid as an instrument for *appreciating* the mediated qualities of the expectation / capacity criterion, it does not help us in the effort to *evaluate* the merits of one hybrid over another. This issue appears especially pertinent to environmental problems, given that people's expectations are frequently linked to issues of physical and social well being. There is therefore a need to know something about the capacity of different hybrids to provide for certain outcomes. Within environmental practice generally the most obvious means for accomplishing this task is through systems of monitoring and evaluation (e.g., Mitchell, 1997). However, a number of issues within the New Zealand context mean that achieving understanding through these practices is problematic. At a national level, a lack of environmental baseline data means that there is generally a paucity of biophysical data against which to assess the performance of environmental instruments used in New Zealand (Hughey et al., 2002). Further, it is evident amongst the groups in this study that the collection of monitoring data was not a favoured activity, with strategies for its collection being limited. The comments of a Waimara member reflect this tendency:

⁷⁷ The work of Latour is usually located within the actor network school of theory. It is necessary to note that Latour himself has not explicitly attached his arguments to environmental issue. Instead, a number of scholars working within this area have drawn on the work of Latour and other actor network theorists to help frame and develop their own arguments (e.g., Eden et al., 2000; Kortelenian, 2000).

No we haven't relied on monitoring as a major tool. We have relied on getting out there and putting a spade in the ground and keeping an eye on it (Member, Waimara, November 2001).

Concurrently, where these groups collected data, it was apparent that the indicators used were usually simple ones that poorly represented what their organisations were seeking to accomplish. A case-in-point was the Hague Stream group, which concentrated on the monitoring of spawning indicators, where a more appropriate measure of their accomplishments *vis-à-vis* their objectives would have been the surveying of juvenile salmon densities (Millichamp pers. comm., December 2002). This and other observations indicate that for groups to undertake monitoring requires a certain degree of expertise and resourcing. As these were typically absent, this is one reason that appears to account for the paucity of monitoring amongst the organisations I studied. Often, in contrast, it was employees from agencies like regional councils who instigated monitoring programmes often, for example, as part of an enrolment strategy (see Chapter Six). This is not surprising, as these agencies appeared to have both the resources and expertise to develop these programmes as well as, often, a statutory requirement to do so (Fieldwork, June 2000 - August 2003).

Simultaneous efforts need to also be made to deal with the scale issues raised in this study, of which there are two key aspects. The first is based on the discernment that groups from this research have tended to frame the scalar dimensions of their activities on the basis of their *capacity* rather than the nature of the problems they have been seeking to manage. By this I mean the scalar frame - that is the scale at which groups operate - was set in accordance to the resources, skills and inclinations of participants. This tendency is reflected in the comments of a Waimara group member:

It's just that matter of scale, the size of our group and the amount of effort required to make something succeed. If it takes too long or is too hard, well! There's a natural limit that's developed in this group (Member, Waimara, November 2001).

This scalar tendency appears to have been a pragmatic *coping strategy* used by groups to ensure they can match their efforts to the resources they have. What is evident in this

research, however, is that the dimensions within these coping strategies have usually not aligned with the physical, social and institutional variables that, together, constitute the optimal scale for addressing problems within a human-biophysical system (Sneddon et al., 2002). Amongst the groups in this study, this disparity appears to have been common in all but the Maine Valley example.

In comparison, it is the example of the Maine Valley initiative that illustrates how the problems generated by this disparity can be overcome. In the Maine Valley situation, the activities of the vector control group have been nested into a wider programme, operated by the Animal Health Board, which has complemented many of their activities and intentions. The sanctioning power of the Board, for example, has ensured that there were complementary vector control initiatives operating beyond the boundaries of the group. This is something that the capacities within the group could not have ensured.

Moving beyond the above argument, it appears that if CEM is to negotiate its way through the problem of scale, two things are necessary. The first, is a supportive institutional environment that integrates the objectives of CEM with those of the wider systems of which they are a part. The second is the development of conceptual models that can illuminate practitioners as to the scale dimensions attached to particular environmental problems CEM is seeking to address. Therefore it may not be possible to cater for all scale issues, a framework can nonetheless be developed that assists in this task. As for the dimensions of this framework, Gunderson and Holling (2002) argue that cross-scale hierarchies integrating economic, ecological and institutional systems are a necessary pre-requisite. Lovell et al. (2002), meanwhile, champions the importance of including temporal, physical and institutional aspects into this framework. Insights from this investigation indicate, therefore, that a model for scale requires three levels. The first level comprises the spatial and temporal, to which there are three parts. These second level components are: (a) physical; (b) social; and (c) institutional. Each of these, in turn, has a micro (scale issues that arise within a group) and macro (scale issues that arise outside of a group) dimension. The resulting model of scale is summarised below

in Table 7.1. The argument, asserted here, is that by conceptualising scale in terms of the dimensions set out in Table 7.1, it should become easier to recognise and appreciate the scale dimensions that imbue the operation of a CEM group. Having inspected the biophysical dimensions of the sustainability triangle, the next section goes on to explore the socio-cultural aspects of the triangle and their relevance and implications to the groups in this study.

Table 7.1: Scale levels and community environmental management

	Level 1	Level 2	Level 3
		Physical	Micro/Macro
	Space	Social	Micro/Macro
		Institutional	Micro/Macro
CEM Initiative			
		Physical	Micro/Macro
	Time	Social	Micro/Marco
		Institutional	Micro/Marco

7.3 Socio-cultural Sustainability and Community Environmental management - Observations and Analysis

7.3.1 Background

In the socio-cultural portion of the 'sustainability triangle' (see Figure 7.1), attention has focused on the necessity of reconciling human well being and security with the biophysical and economic aspects of the human-biophysical systems people occupy (see Preister and Kent, 1997). Within this context, attention has been drawn to the contribution that citizen participation, the promotion of equity (intra and inter-generational) and livelihood security can make to this goal (see Adams, 1990; Grundy, 1993; Mitchell, 1997). Covering this range of variables is beyond the scope of this study; moreover, the data collected supports the exploration of certain themes over

others. For these reasons, the focus in this section is on matters associated with the topic of citizen participation.

Exploring the treatment of participation within sustainability writings, its origins appear both theoretical and practical. The politically charged theories of eco-feminism (e.g., Mies and Shiva, 1993), eco-racism (e.g., Millar et al., 1996) and social ecology (Bookchin, 1990) for example, have respectively identified the importance of citizen participation as a device for promoting societal well being. Practical experience with small-scale, citizen-based institutions has demonstrated, concurrently, how participation can circumvent development problems within local communities (see Dahl and Tufts, 1973; Midgley, 1986). Together, these theories and experiences have contributed to an argument that by empowering local peoples, decisions and actions that promote sustainability follow (Dewitt, 1994; Warburton, 1998)⁷⁸.

The image of citizen participation that arises from the above description is one where power and responsibility is mutually shared between the state and local resource users (Brasell-Jones, 1998). CEM, in turn, has been represented as providing an 'enabling' institutional environment that can facilitate this process (See Chapter Two). In terms of the objectives of this study, a question requiring investigation is the extent to which the processes and outcomes associated with my six case studies are consistent with this normative expectation.

In response to this question, observations intimate that while participation was indeed promoted through the organisational structure of the six groups, the form and scope of this was not as all encompassing as suggested by the normative descriptions of CEM (e.g., Western and Wright, 1994). In contrast, participation patterns, in terms of who participated within these groups and the treatment of particular social cohorts

⁷⁸ The reasons given for this are manifold and include: (a) through participation the concerns and needs of local peoples are recognised and can be subsequently factored into management processes; through this, (b) potential sources of conflict and tension can also be identified that might disrupt management processes; (c) encouraging participation provides access to the resources that reside in local communities; and (d) the sense of empowerment engendered by participation increases local people's ownership of management decisions and hence their willingness to participate in their implementation (see Berkes et al., 1991; Leach and Pelkey, 2001).

within them, were highly variable. For example, case study insights suggest that the actors participating across the six CEM groups were usually only a portion of people who, in a traditional sense, comprise the 'community'. A more detailed description of what was observed and explanations for these follow in sub-sections 7.3.2 - 7.3.4, while in 7.3.5 I explore the implication of these processes for the form and performance of CEM.

7.3.2 Participation, engendered natures and community environmental management

A prominent feature of the three social-oriented groups in this study (i.e., Waimara, Kemp's Drain and Hague Stream) was the low number of female participants⁷⁹. This low number indicates that in terms of socially defined gender interests, there was a lack of members present to bring the engendered interests of women to the fore of these groups. Evidence of this is that all six groups were observed to have subsequently engaged in activities that confirmed and reinforced masculine notions of environmental management. These notions, as Moeckli and Braun (2001) describe, include concerns with environmental conservation and restoration whereas, they suggest, the nature interests of western women are constructed around the themes of family, health and security. It is apparent, for example, that both the Kemp's Drain and Hague Stream initiatives entailed management activities linked to the masculine notion of restoration (Moeckli and Braun, 2001). The themes of the Waimara group, also, echoed similar masculine themes, although some of the activities it engaged in - Moeckli and Braun's (2001) typology suggest - would also have appealed to Waimara women (e.g., benefits to the family of clean water). As a factor, this could account for the slightly higher involvement of women in this organisation, compared to the other two socially oriented groups.

⁷⁹ In the Waimara group two women were regular participants in the activities of the group, this was out of a total of ten members. No women members were present in the Kemp's Drain membership and only one woman was identified as an active member in the Hague Stream group (out of a membership of fifteen to twenty people).

Drawing from this point, my argument is that the masculine environmental focus of these groups has affected who, on the basis of gender, would wish to participate in these organisations. As an influence, this was recognised by members of the Waimara group. One of the two women involved in this organisation, for example, considered that its activities had not garnered wider female support because the work and administrative approach of the group was, in her words, a 'bit blokey' (Interview, November 2001). Another member suggested, consistent with the gender themes described above, that there were other groups in the Waimara area whose focus was more appealing to the (engendered) nature interests of women. His comment was:

In the other groups that I am involved with the core issues, for example organic growing or the food co-operative are food, health, family, safety, and that draws women, I believe, to these groups . . . whereas the estuary isn't quite like that, it is one step removed from immediate health, safety, family things (Member, Waimara group, November 2001).

Examining other causes of low female involvement, two further elements arise from the examples of the Kemp's Drain and Hague Stream groups. As described in Chapter Four, these organisations evolved out of angling networks, involving people who fish for recreational freshwater species (see Chapter Four). As Franklin (1998) and Dahles (1993) have argued, these pursuits have evolved as masculine activities dominated by men, a point noted from my own experience in recreational fisheries management in New Zealand. Given the gender specificity of angling, it is therefore not surprising to observe that conservation activities premised on promoting fish habitat have appealed more specifically to men than women. Moreover, because women have tended to remain outside of angling club networks (for the reasons described above), it was again less likely that they would be drawn into these organisations through network associations.

Together, the two processes described above suggest that matters arising from how gender interests are reproduced through CEM can act as constraints on participation

amongst groups where participation is a matter, essentially, of free will⁸⁰. Reinforcing this argument is my own field experience of other waterway restoration initiatives in the Canterbury region. My observations have been that when these have gone beyond salmonid restoration interests and embraced wider issues, including those linked to family health, then the involvement of women has increased. A case-in-point was the higher levels of female involvement (compared to this study) in an initiative to restore the Avoca Stream in the Port Hill margins of Christchurch (Christchurch City Council and Lucas and Associates, 1996).

7.3.3 Strategies of exclusion

Deliberate strategies of exclusion have also impacted on who has and has not participated in the CEM groups in this research. The key influence here has been the employment of strategies that have excluded people who, if given the opportunity, would have participated in a group. This pattern was most apparent in the Barry's Stream case study where, as described in Chapters Five and Six, anglers and Fish and Game Council staff had (up to 2003) been excluded from significant decision-making roles within this organisation. A number of factors contributed to this.

The first was the political processes described in Section 6.3.3, whereby it has been in the political interest of group members to prevent other stakeholders from joining their organisation and having the opportunity to promote their (alternative) social nature claims. The other has been an appreciation that the involvement of these 'outsiders' could generate negative impacts on aspects of local social capital. In both the Waitutu and Barry's Stream cases, for example, the involvement of non-residents in their respective groups would not have sat comfortably within the local patterns of social norms. It was also apparent in the Maine Valley and Waitutu examples that institutional reasons had affected who was and who was not able to participant in a group. In the Waitutu case, for example, participation rights were conferred through the ownership of

⁸⁰ Another factor, expressed by one male participant I interviewed from the Kemp's Drain group was that the physical nature of the work involved at workdays and the associated working environment (e.g., lack of toilets) was unlikely to have made involvement in the group attractive to potential female participants (Interview, June 2001).

legal water abstraction permits. Similarly, in the Maine Valley situation, ownership of bTB vulnerable livestock (cattle and deer) was the institutional factor that defined membership.

Together, the patterns described in this and the preceding section reveals factors that affect the inclusiveness of participation. The next section explores how parties who participate *within* groups are treated in terms of access to power and the ability to assert their social nature interests.

7.3.4 Participation patterns *within* groups

The other side of the participation question is how do those who *are* involved inside groups fare in terms of the representation of their interests, including their participation in decision-making processes. Do the patterns observed, for example, demonstrate situations of mutually shared power and responsibility that are described by some theorists as an ideal for sustainability (see Brasell-Jones, 1998)? In response to this question, insights from this study reveal considerable discrepancies between this image and what was observed. In exploring these, two noteworthy patterns emerge.

The first, common to varying degrees across all six groups but especially prevalent in the case of the three productive-oriented groups, has been the tendency of the authorities dealing with them to maintain a controlling role over decision-making and the management of knowledge. For example, while Environment Canterbury and the Animal Health Board were willing to respectively cede the physical responsibility for waterway restoration and bTB vector control to local actors, this was not followed by the corresponding allocation of levels of power. In this respect, the participatory exchanges between these authorities and the respective groups have borne the controlling qualities of the top-down relationships that have historically imbued the command and control approaches to environmental administration (see Chapter Two).

In turn, secondly, the pattern of participation indicated in these relationships has been one that lies between what Agarwal (2001) suggests as *activity-specific* and *active*

participation. Within these categories, the first is underscored by a notion of participation in which people *volunteer* to undertake certain tasks, while the second is characterised by patterns of participation where opportunities exist for the *expression of opinions* into the decision-making apparatus (Agarwal, 2001). What emerges from these descriptions is that opportunities for empowerment through these groups have been limited and certainly not mutual in terms of matching responsibility with authority (Agarwal [2001] uses the term *interactive participation* to describe the situation where these opportunities prevail). The result has been participatory patterns that fall short of the notions of mutual sharing articulated in normative expressions of socio-cultural sustainability (see Brasell-Jones, 1998).

Moving to the intra-relationships within these groups, there appears to have been unequal treatment of men and women within them in terms of power sharing. Again, as for the inter-group relationships, this runs counter to the normative expectation of participation within the socio-cultural sustainability literature. In particular, it appears from observations in this research that while these institutions have provided for the *practical* and *strategic* gender needs of men, those of women were to a greater extent ignored⁸¹. An instance here has been the tendency for group meetings and field events to be organised around times conflicting with the domestic responsibilities of women (i.e., a practical gender issue). Similarly, efforts to manage for this situation by providing childcare facilities at meeting sites did not occur. For example, of the six meetings of the Waitutu group I attended, all but one was in the evening; this being a time usually not suitable for women due to gender-defined family responsibilities (e.g., child minding).

Moving to *strategic gender needs*, the decision-making structure of all three of the productive-oriented groups squarely remained the preserve of men. Men, for

⁸¹ The notion of practical and strategic gender needs has been developed by Moser (1993) and applied to CEM issues in New Zealand by Brasell-Jones (1998). Practical gender needs refers to those requirements that emerge out of men or women's socially constructed gender position. In terms of CEM, it would refer to the provision, for example, of childcare opportunities so that women with families can attend group meetings. Strategic gender needs, meanwhile, refer to the opportunities that allow men or women to challenge gender stereotypes or occupy non-traditional roles.

example, held the executive roles in all of the groups in this study⁸². Because of this pattern, the logical argument to follow is the claim that these groups have engaged in the assertion of masculine gender needs, as opposed to feminine, onto the local political and material landscapes that the six groups have inhabited. While I concede that this appears to be true in the case of the social-oriented groups, this argument must be re-evaluated in the context of the three productive-oriented groups. This is because, while these organisations have contributed to a gendered male interest in production (see Beilin, 1997; Clifford-Walton et al., 1998). Concurrently they have also contributed to the well being of the rural family by ensuring livelihood security. This, as noted earlier, is a nature gender concern of women (Moeckli and Braun, 2001). In accomplishing these dual ends, these groups have equally catered for the practical gender needs of women as for those of men. This capacity for CEM to provide for dual gender needs has not previously been emphasised in CEM research in Australasia. The tendency, instead, has been to emphasise the benefits that participation accrues to men (e.g., Brasell-Jones, 1998). Moving on, the implications of the processes described in the preceding sub-sections are now considered below.

7.3.5 Implications

A pervasive argument across the community and participatory narrative descriptions of CEM (see Chapter Two) is the contention that a positive relationship arises between the presence of community-based institutions and the opportunities for community participation (e.g., Fox, 1992; Pye-Smith et al., 1994). Sustaining this image, Agrawal and Gibson (2001) contend, has been homogenous notions of community, which have 'papered over' the differences that arise at the local levels of society. Observations from this study have, for example, demonstrated this in the context of gender relations. What Agrawal and Gibson's (2001) comments and the insights from this study highlight are the necessity for a more context-specific appreciation of community; this is one that caters for the differences observed in this study. At the discursive level, this would be advanced by the addition of suitable adjectives to the

⁸² A women member in the Waimara group had the official role of secretary when interviewed in 2001.

word 'community', such as the notion of 'participating community' invoked by Thompson (1971). The inference here, of partial participation, is one that suits as a qualifier for the patterns observed in this study.

Simultaneously, while the preceding description has illuminated as to how participation within my CEM groups has tended to fall short of the normative themes of sustainability, it also highlights reasons for caution in considering changes to these (e.g., by obliging groups to extend membership). It can be anticipated, for example, that efforts to change some of the participatory patterns I have described would encourage outcomes that could threaten the capacity for effective collective action. Drawing on the findings from Chapter Five, for example, one would anticipate that the opening-up of participation within the productive-oriented groups to a broader range of stakeholders would invoke negative consequences for the social capital relations that benefit present patterns of collective action. It can be expected, for instance, that levels of trust would be reduced by the suspicion of new entrants. This, in turn, would reduce the levels of openness and honesty, a point recounted in the following comment of a Barry's Stream member below:

... if we have someone whose got other than land interests in the group, then the chances of getting that degree of openness and honesty are bloody remote (Member, Barry's Stream, September 2001).

Invariably, situations would also arise where new entrants would transgress local social norms and rules. These examples highlight the *socio-political* roots that shape and sustain existing patterns of participation, and highlight why resistance to more inclusive patterns of participation exists within the human environments of CEM.

It can also be expected that there would be considerable structural resistance to changes in the participatory relations I have described, especially those involving the authority of management agencies. Research by Prystupa (1998), into the obstacles facing the development of co-management arrangements within New Zealand, illustrates this pattern. His research identified that concerns about the erosion of power, prestige

and resources amongst professional management staff had constrained the development of a more participatory regime for the management of Lake Ellesmere / Te Waihora, a shallow lake to the south of Christchurch (and into which Barry's Stream discharges). Similar to the previous paragraph, this example illustrates the deeper roots - this time *political-economic* - that shape existing patterns of participation. As above, these are not necessarily easy to overcome in an effort to promote more inclusive patterns of participation within CEM.

While my analysis of gender needs within the productive-oriented groups suggests that there are grounds for optimism in terms of the expression of both masculine and feminine concerns, it is also apparent that the responsibilities conferred through these arrangements have interacted with wider changes in rural gender relations. Some of the resulting effects of this have not been positive for the well being of local communities (as reflected in the episode described below). Obviously, such changes lie deeper than the contribution made by CEM; with roots, for example, in post-1980s rural change. An example of this, from the Maine Valley, is described below.

A feature of the Maine Valley group has been the direct responsibility of two of the women from the Valley for the vector control on their properties. As an output, this pattern is consistent with wider change in rural New Zealand, wherein the gender role of women in the farm labour complex has been progressively re-defined (Clifford-Walton et al., 1998). The key change here has been the increasing direct involvement of women in the economic activities of farm properties. This compares to the situation prior to the 1980s, when women's labour contribution centred on household activities (e.g., child rearing and domestic tasks). In Maine Valley, as elsewhere in rural New Zealand, this change has precipitated a re-defining of female social relations, particularly as women have had less time to maintain the networks that they previously engaged in. One such network, previously prominent in Maine Valley, was one that worked to ensure that women susceptible to social isolation did not become alienated (e.g., those with new born babies or newly arrived to the Valley). In recounting the importance of this relationship to the social well being of the Valley, one of my female informants noted

that her capacity to participate in this network had, as for other women, been eroded by the demands of farm labour activities on her time (this included the time demands of participating in vector trapping, a CEM activity). Her own reflections on this are summarised in the comments below:

I'm not lonely, but when I first came here I was. And Norm's mother next door used to ring up; she used to ring me up each week and she had me up for tennis and she would ask me up for coffee, and I don't do that for anybody in return because I am too busy. I just think that is a loss (Female member, Maine Valley, August 2001).

Obviously, CEM itself is not the sole cause of the change described above, nevertheless as a contributor to the redefining of female labour roles in Maine Valley it demonstrates how community-based programmes can accentuate other social developments within a social setting. This includes, as in this example, developments that have implications for the social health of a community. Such impacts can be anticipated to have consequences for social sustainability, as factors that impact on the health of communities can jeopardise their sustainability (see Agarwal, 2001). I now turn, in the next section, to an assessment of my CEM case studies based on the themes of economic sustainability.

7.4 Economics, Sustainability and Community Environmental Management

7.4.1 Background

Within notions of economic sustainability, attention has concentrated on ways of balancing resource exploitation with the life-supporting capacity of the earth (Daly and Cobb, 1990). In the sustainability literature this has been translated into a focus on modes of consumption that: (a) maintain the reproductive capacity of renewable resource systems; (b) minimise and manage for externalities; (c) encourage efficiency; and (d) promote equity (Dixon and Fallon, 1989; Jacobs, 1991). While I consider the first variable is explained through the analysis in Section 7.2, the other three aspects require clarification.

Firstly, the notion of managing externalities focuses on the argument that those creating environmental 'bads' from their use of the natural environment should 'internalise' these (e.g., contaminants released into the air or water). By this it is argued that they should either prevent these bads from arising or meet the costs of remedying them, instead of simply passing them onto other users (Jacobs, 1991). In this study, I term this concept the *internalisation argument*. Efficiency, secondly, has two parts to it. The first, technical efficiency, is concerned with the promotion of means that maximise the positive effects from the use of resources (while minimising the negatives). The second, allocative efficiency, deals with the comparative uses to which a resource can be put and which of these can provide the greatest output of positive benefits (Hamilton, 1997). Finally, within the theme of economic sustainability, the notion of equity is invoked through the consideration of how the costs and benefits of resource use (including opportunities foregone) are managed within (intra) and between (inter) human generations (Gorringe, 1999).

From a policy perspective, efforts to promote economic sustainability have focused on the means of reconciling the above variables with the biophysical and socio-cultural ones I have already described (e.g., Diesendorf and Hamilton, 1997). In terms of using CEM to accomplish this, findings from this research reveal two key challenges - in the form of dilemmas - that can frustrate these efforts. I paraphrase these as: (a) the 'internalisation argument' dilemma; and (b) the 'production first' dilemma. In the following two sections, each of these dilemmas is described and their implications for the relationship between CEM and sustainability investigated, using insights derived from my six case studies.

7.4.2 The 'internalisation argument' dilemma

The analysis in Chapter Six highlighted the interpretative origins of what is understood as 'nature' and 'nature change'. It demonstrated, with reference to stream-side riparian zones, how these are more than physical spaces, they are also symbolic places imbued with different meanings. It is these meanings, I argued, that people use - partially at least - to organise their actions towards the physical environment around. In

contrast to these processes, what is self-evident within normative descriptions of the internalisation argument within the sustainability literature is that these processes go unrecognised. In this sense, the internalisation argument suffers as Latour (1993) writes, from *purification*; that is a process where the physical and social worlds are considered distinct. This was exemplified, for example, in the New Zealand government's *Environment 2010 Strategy*, where the internalisation argument was listed as a management principle for future environmental administration in New Zealand (Ministry for the Environment, 1995). In the description of this principle, it was evident that the treatment of the environment was one where it was construed as a fixed *physical* entity, with none of the interpretative aspects I have described in this research.

It should be self-evident that interpretative differences over what an adverse effect is and from this, who should take responsibility for it, poses a challenge to the theoretical assumptions of the internalisation argument. I have already described, for example, how interpretative differences have provided a barrier in the efforts to have farmers engage in riparian management strategies that ameliorate the effects of their stock on waterways. The fact that farmers *have* subsequently set aside such things as riparian strips, indicate that reasons *outside* of the internalisation argument may have compelled this action (examples of these forces are set out in Chapter's Five and Six).

One of the repercussions of the interpretative processes I have described, has been an outlook amongst farmers that is virtually the opposite to the sentiments of the internalisation argument. Exploring the example of riparian strip creation, many farmers indicated in interviews that they felt they were being obliged to supply a *public good* at a private cost to them (i.e., internalising other people's costs) in developing and managing these. This sentiment is reflected in the comments, below, of a Waitutu farmer:

You know, let's be reasonable about this, the community's expectations are very high and they are always nice and easy to be very high when someone else is footing the bill. In other words they are expecting the owners of land to supply it free, and we are talking about land here that is valued at \$10 - 12 k an acre (Member, Waitutu, June 2001).

The belief, amongst farmers, that they have contributed to society's well being through the creation of riparian strips has two implications for the internalisation argument as a sustainability construct. Theoretically, it illustrates how interpretative differences can create a disjuncture between the assumptions of the internalisation argument itself, and what people see as their responsibilities. Simultaneously, at a practical level, the idea that in providing a service or resource an actor is generating a public good has contributed to practices whereby farmers have sought to minimise their contributions. This, as illustrated in Chapter Six with the example of riparian strip development, can lead to physical outcomes that limit the net physical benefits of an activity (e.g., by the creation of narrow riparian strips).

In summary, what the cases presented here illustrate is that, as a theoretical construct for promoting sustainability, the internalisation argument is underscored by the limits of purification (Latour, 1993). As a result of this, it proceeds with an oversimplified version of reality that is susceptible to the impacts of the interpretative differences when applied in a human-biophysical context. This problem suggests that attempts to ground CEM on the principles of the internalisation argument will face the likelihood of human action that rebuffs assumptions about whom and how people should act in certain situations, unless these issues are recognised and managed for.

7.4.3 The 'production-first' dilemma and economic sustainability

Within the ideal assumptions of economic sustainability lies the notion that human consumptive practices should operate in tandem with considerations for biophysical and socio-cultural sustainability (Dodds, 1997). In regard to this consideration, observations of practices across the productive-oriented CEM case studies reveal pressures and constraints that impose limitations on this expectation. In particular, findings intimate that the capacity and willingness of farmers to participate in CEM activities is closely linked to their economic position. At the centre of this is a concern amongst farmers of 'being profitable', at least in the short-term, through the maintenance and improvement of production levels. This concern is aptly captured in the following statement of a Maine Valley farmer:

I think we focus more on putting effort into what we are going to get a return out of . . . most of our effort is put into the productive base (Member, Maine valley, August 2001).

Egoz et al. (2001) suggests that this emphasis on production has historic and social origins, while at the individual level McHenry (1998) suggests it can be understood as emerging from a desire for livelihood security. In turn, what is apparent, from this research and these other studies, is that New Zealand-wide there exists the tendency of farmers to sacrifice biophysical and social sustainability considerations to ensure economic productivity. Further, the focus of this outlook can be very short-term, with the consequence being practices that ultimately undermine farm viability for present-day economic gain (e.g., non-fertilisation of pastures)⁸³.

At an operational level, aspects of the production first dilemma appear to complicate efforts to promote sustainability through CEM, at least in terms of the farmer actors in this inquiry. Foremost, it intimates that the further a CEM activity is seen to deviate from the productive imperatives of a farm, the increased pressure there will exist to curtail involvement. In turn, understanding the dynamics of the dilemma also highlights what needs to be emphasised in strategies designed to engage farmers within voluntary resource management activities. The insight that evolves from the above points is that the more an activity is interpreted by a farmer to advance their net private concerns the more likely it is that they will engage in it, incidental to any of the public good benefits it is perceived to create. Simultaneously, in terms of addressing the 'sustainability triangle', it suggests that practically - for farmers - sustainability involves a balance between activities that are considered productive and non-productive. As an outlook, this was reflected on the national stage, in 2003, in the comments of a winner of a regional farm environmental award, who stated:

We're trying to get the balance right. The key thing is that environmental improvement must be in tandem with production and profitability . . . it's a

⁸³ The administrators of the *Rabbit and Land Management Programme* described to me, for example, how many high country farmers facing the effects of rural downturn and declining commodity markets (mid-1980s to mid-1990s) had progressively curbed activities, such as weed control, to reduce expenses. This was despite these activities being of importance to the long-term sustainability of their farm operations (Donald Ross pers. comm., March 2003).

chicken and egg thing; you couldn't put it in if you weren't profitable (Farmer quoted in Keene, 2003, p. B8).

What is also apparent from the wider literature on rural change in New Zealand (e.g., Cocklin et al., 2000) is that since the 1980s, the balancing process inferred in the comment above, has tilted disproportionately towards productive considerations. In part, Cocklin et al. (2000) attributes this to the consequences of the neo-liberal reform environment that has imbued decision-making in rural New Zealand over the last twenty years. They argue this has increased uncertainty and risk for farmers, compelling them to maximise economic returns when and where they can. Operating within this setting farmers have typically had less time to devote to activities that protect the biophysical environment. Comments from farmers interviewed from the three productive-oriented groups in this research support this argument; while also intimating at other pressures that had accentuated this constraint (e.g., health and safety planning). A Waitutu inhabitant summarised the resulting situation he faced as a consequence of these developments, when he noted:

We have to spend more and more time in the office or more time basically just keeping the place running, rather than getting out on the farm and doing the manual or the outside work that we enjoy (Member, Waitutu, August 2001).

Exploring some of the implications of the production-first dilemma for the relationship between CEM and sustainability, two dominant issues arise. Firstly, and most obviously, it is apparent that the willingness and capacity of farmers to participate in CEM activities is affected by their perceptions of their economic well being. At this point, the oft-used rural maxim comes to mind: 'it's hard to be green when you are in the red'. From an operational perspective, this means that participation in voluntary initiatives is less likely to reflect concerns over biophysical issues when and where other pressures exist on farmers' financial and time resources. The degree to which this situation prevailed across the informants from my three productive case studies was extensive, while the persuasiveness of this effect on farmer action is ably demonstrated in the comment, below, from an interview with a retired former dairy farmer:

Me: What thing, from your experience, limits farmers from putting aside more riparian strips and doing that sort of thing?

Informant: Probably similar things that limited us! It was time and money, and we were really interested in protecting our farm, our little streams, and making things better for the next people. And we still had trouble fitting it in because, particularly dairy farming has become more and more busy; you know more and more concentrated on production. The cows and growing the grass to feed the cows comes first, and those environmental matters come way after that (Informant, November 2001).

Accentuating the above implication, secondly, is an appreciation, drawn from this inquiry and the work of others (e.g., Falconer, 2000), that a range of transaction and opportunity costs are incurred by those who participate in CEM enterprises. Amongst the participants from the productive-oriented groups, these appear to have been compounded because these costs have been incurred at the immediate expense of other, productive, interests. A case-in-point is the financial and on-going labour costs that the creation of a fenced riparian strip creates for a farmer (a transaction cost). Further, the removal of this land from the productive portion of the farm constitutes a direct opportunity cost to the occupant, by way of agricultural output foregone. Overall, when these various factors are considered, the problems confronting farmer participation in riparian management appear numerous. The comments, below, of a Barry's Stream farmer captures aspects of these:

I don't want to be spending a whole lot of time spraying around trees [in the riparian strip]. I mean you are prepared to do that sort of thing in your own garden but [laugh] when it comes down to a stream like that, I mean there is just so much work (Farmer, Barry's Stream, December 2002).

This section closes with some analytical reflections on what the arguments raised in this section pose for the relationship between CEM and economic sustainability.

7.4.4 Reflections: Community environmental management and economic sustainability

Starting at the general level, the first observation is the need to question assumptions about the relevance of the internalisation principle as a means for understanding and directing human action towards sustainability. At the heart of this

question lies the observation, from this project, that the willingness of individuals to internalise the effects of their activities is affected by their interpretative understandings of nature and nature change. Invariably, this has become linked to the personal perception amongst different actors of who will benefit from a particular course of action and the associated normative responsibility they feel for undertaking a management task. On these points, observations from this study intimate that the more a project, such as creating a riparian strip, is interpreted as accruing a private benefit to, for example a farmer, the more likely they are to willingly participate in this activity. Conversely, if they view the creation of a riparian strip as essentially the provision of a public good, then the more likely it is that they will question and resist this activity. In this regard, insights from this study intimate that the interpretation of private versus public good costs has roots, partially at least, in how people interpret nature and nature change.

In the context of this section's focus, these processes can be drawn on to account for the comparable difference between the willingness of farmer involvement in CEM activities in the Maine Valley, Barry's Stream and Waitutu areas. For the former (Maine Valley), trapping bTB vectors has had an obvious direct private benefit to them in terms of reduced herd infection rates for bTB; for the latter (Barry's Stream and Waitutu), the links between action (e.g., setting aside riparian strips) and private benefit have been more tenuous. However, as previous episodes involving the latter groups suggest, private benefits can be more than economic, they can also have a political and social dimension. On this point, I believe that the political advantage that the Waitutu group has accrued by symbolically presenting riparian strips as an example of 'farmer guardianship' has created a form of private benefit for them. The complicated nature and intricacies of such processes highlights the need for a more robust interpretation of the internalisation principle than that which has traditionally existed in the economic sustainability literature (e.g., Jacobs, 1991). Included here needs to be an understanding of how different activities can be construed as beneficial to different parties.

Secondly, the production-first dilemma poses self-evident challenges to CEM where and when the key ‘community’ actors are farmers. As such, the observations made in this inquiry are consistent with those made by Cocklin et al. (2000) and their study of Northland pastoralists. Their research surmised that for farmers in this region, sustainability came down to a question of economic self-preservation, even at the expense of social and biophysical concerns. Simultaneously, farmers also need to be able to meet the opportunity and transaction costs of CEM participation; with it being anticipated that the less an activity generates a net private benefit the more unwilling they will be to participate. Comparatively, in the European Union some of these issues have been negotiated through by the application of subsidy systems linked together under the title of agri-environmental policies (McHenry, 1998). The likelihood of similar supportive policies within the market-led policy environment of New Zealand (beyond the present contestable fund systems) seems unlikely. Yet the points raised in this analysis highlight interpretative reasons as to why and how this could improve the relationship between those expected to deliver on CEM expectations (e.g., farmers) and sustainability.

7.5 Chapter Insights: Re-visiting the objectives of this study

7.5.1 Assessing group contribution and performance

On the surface, the themes that adhere within normative expressions of CEM suggest that it should provide an ideal vehicle for promoting the tenets of sustainability set out in Figure 7.1. The idea of using the ‘community’ to accomplish local outcomes seems an ideal means, for example, of promoting citizen participation. Further, because communities have to deal with the repercussions of their actions, it also appears a logical mechanism for achieving the reconciliation of the socio-economic and biophysical elements of sustainability. What this project indicates, in contrast to such expectations, is a set of trends and associated processes that complicate this reconciliation. In the following discussion, these are summarised and their effects on group performance noted. Before doing this, however, a qualification about the relationship between sustainability and CEM follows.

Inspecting the issue of biophysical sustainability firstly, two prominent trends emerge that underscore the contribution and performance of the six CEM groups. The first is the appreciation that the capacity of groups to effect change in an environment is contingent upon the capacity of the managed system to adjust and meet their expectations. What appears to be the key here is how a group's goals align with the processes occurring within a system. The processes summarised in Figure 7.5 indicate that if a group's activities equate to managing a perturbation within a system, then they will be more effective in advancing their goals, than if their activities amount to an attempt to adjust a system's human and non-human equilibrium *state*. In this regard, one can argue that the cases in this research, with the exception of the Hague Stream and Waimara Estuary Care examples, have been comparatively more effective, as their activities have constituted a situation where members' normative expectations have corresponded to the capacity of the environment to meet them.

Also influential from a biophysical perspective, secondly, is the scale that a group organises its activities, relevant to the issues it is seeking to manage. Observations from this project are that the more a group is able to embrace the physical, social and institutional dimensions that instil local environments, the more effective they will be in meeting their biophysical goals. In regards to this variable, the Barry's Stream and Maine Valley groups appear to have been the most effective, the former because its membership boundaries have covered the greater part of the social and physical environment relevant to its management concerns. In the Maine Valley case, its comparative effectiveness has occurred because it has been nested within an institutional environment that has allowed a number of scale issues relevant to its management issue to be accommodated. In contrast, in seeking to address salmon and trout population issues and the condition of an estuary, the Hague Stream, Kemp's Drain and Waimara groups have, respectively, only embraced a narrow portion of the environment directly relevant to their concerns. The Waitutu group, meanwhile, falls in between these two groupings mainly because, while incorporating a number of land users within its operating catchments, it has not captured them all.

Drawing back from these points it is relevant to note that the situation of a group 'meeting its goals' is not in itself an indicator that biophysical sustainability is being accomplished, at least in the sense of the qualities summarised in Figure 7.1. The physical goals of a group may have very little to do, for example, with managing for the overall biophysical state of a system. In the Hague Stream and Kemp's Drain instances, for example, the promoting of salmonid values may have been to the detriment of local indigenous species. This situation highlights the subjective qualities that can attach to notions of sustainability.

Concurrently, one must acknowledge the issue of relativity as it relates to group goals. It is apparent that within a more limited scale setting the Waimara group, as an example, has been effective in achieving change to the Estuary environment (human and non-human). A case-in-point is the changes it has achieved through its wetland reserve project (see Plate 4.12). Were one to therefore set the normative goals of the group at the level of this project rather than those described in this study, then the assessment of its effectiveness would be more positive. This suggests that the narrower a group's focus, in terms of its goals and the scale of the issues it seeks to address, the more likely it will be to achieve them.

From a social perspective, more specifically the issue of participation, two trends emerged from this project as influencing the level of this variable. The first was the degree to which the activities and processes associated with a group were able to serve the practical and strategic needs of different human actors. The second was the tendency, relevant to the productive-oriented groups, of the deliberate exclusion of certain stakeholders. Looking at the former quality firstly, it is apparent that none of the six groups were able to provide for the practical and strategic needs of all potential participants. Instead, in the productive-oriented groups, these needs were oriented very much towards the productive concerns of men. With this trend the effect for women, who were considered *de facto* members within these three groups, was that their needs became sub-ordinate to the gender concerns of men.

Conversely, amongst the social-oriented groups where membership was explicitly voluntary, decisions to not participate reflected, in part, the recognition by actors that their needs would not be advanced by membership within these organisations. Compounding this trend was the lack of network linkages that meant, again in the case of women, that the likelihood of their participation was reduced when it came to membership of the three social-oriented groups (e.g., because they were not members of the local fishing club that, for example, was a primary membership source of the Kemp's Drain initiative). The second process, that of exclusion, saw physical representation denied to certain actor groups (not just women). The presence of both of these patterns suggest that 'all encompassing' notions of participation are not the automatic consequence of the operation of a CEM group. Nor can it reasonably be expected that a group, without significant assistance and encouragement, can cater for the needs of all stakeholders⁸⁴. The capacity to promote this social sustainability variable, as shown through this study is therefore inherently limited.

It is evident from the insights in this chapter that the dilemmas of internalisation and production-first restrict the capacity to promote sustainability across the six groups in this project. The strong dependency of regional economies (and farmers' economic well-being) on the exploitation of New Zealand's land resources accentuates this problem (c.f., Daniels, 1992). For example, while agricultural products make up the majority of New Zealand's export earnings; they are also a principal source of many of the nation's environmental problems (Ministry for the Environment, 1997). The consequence of this, amongst the initiatives studied in this thesis, has been that efforts at promoting sustainability have been confronted by the necessity to fall in behind concerns over the health of local rural economies; this preference has been described, by one commentator, as generating a 'weak' notion of sustainability (PCE, 2002).

⁸⁴ The development of collaborative decision-making forums, an example of which includes a group of stakeholders brought together by Environment Canterbury to address management issues in the Lake Ellesmere / Te Waihora catchment represents a process that can provide this coverage. Reflecting on observations from this study this style of initiative appears to offer a suitable rejoinder to some of the participation issues I have noted in this chapter.

As a model for explaining sustainability approaches within New Zealand, the 'weak' sustainability interpretation raises numerous issues for efforts aimed at promoting human and non-human change through CEM. It also raises questions about the comparative performance of the six groups in this study⁸⁵. Foremost here is the observation that strategies that are capable of aligning biophysical and social outcomes with the present productive well-being of producers, such as farmers, are more likely to be effective than those that do not. Although at an overt level, such connections are difficult to observe in this research, at a covert level they were found to be often present. Moreover, they help to explain the actions of farmers in the likes of the Barry's Stream and Waitutu catchments where, as shown in Chapter Six, concerns over waterway quality were not usually productive worries. For example, in these cases, it is evident that the wish of farmers to uphold their productive relationship with the local environment was a dominant spur in encouraging their actions to protect aspects of their local waterways. Through such examples it can be appreciated as to how the linking of productive concerns with certain biophysical actions can promote sustainability (albeit within a 'weak' construct of the concept).

Using the above discussion points as assessment criteria, it is apparent that the three productive-oriented groups, through the linkages described above, have engaged in actions that can be said to promote (weak) sustainability. Similarly, the Hague Stream group also appears to have benefited from the local farmer drawing the connection between his productive well-being and the removal of stock from the stream. Conversely, because no producers were interviewed for the Waimara and Kemp's Drain studies any inferences made around this trend to these cases must be treated as speculative. Nonetheless, wider tendencies within New Zealand as well as observations from elsewhere in this study, support the extension of this argument to them.

Table 7.2 summarises the performance trends of the six CEM groups in this study, based on the variables drawn from the discussion in this section. In this context,

⁸⁵ The questions over the comparative merits of 'weak' and 'strong' sustainability are the topic for a thesis in themselves. For a cogent and concise argument on these, reference to a 2002 report by New Zealand's

these can be thought of as sustainability performance measures, with the yes / no responses summarised on this table being based on observed tendencies rather than quantifiable measures. Key observations summarised in Table 7.2 include: (a) the lack of initiatives that were designed to cater for scale issues relative to group objectives; (b) the non-inclusive treatment of community needs provided by the six groups; and (c) the presence of a positive relationship between productive matters and biophysical outcomes in four of the group case studies. In the next section I explore what the insights from this chapter suggest by way of a response to the goal and objectives of this study.

Table 7.2: Sustainability and community environmental management: Case study performance

Groups	Variable									
	Groups managing for perturbations in the environment		Scale practices relevant to group objectives		The practical and strategic needs of participants are catered for		Inclusive of full range of stakeholders		Productive concerns take precedence over other considerations	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Maine Valley	■		■			■		■	■	
Waitutu	■			■		■		■	■	
Kemp's Drain	■			■	■			■		N.A.
Barry's Stream	■			■		■		■	■	
Hague Stream		■		■	■			■		N.A.
Waimara Estuary		■		■	■			■		N.A.

KEY

■ Yes

■ No

N.A. Not applicable

7.5.2 Form, function and theory

The observations from this chapter highlight an array of processes and outcomes that can encourage and frustrate the contribution CEM makes to the accomplishment of the normative themes within the concept of sustainability. These suggest that achieving sustainable outcomes through CEM is more problematic than it is commonly portrayed in the popular literature (e.g., Pye-Smith et al., 1994). Exploring the issue of participation as an instance of this, while the sustainability literature invokes arguments for open and collaborative participation, a number of matters emerge from this study to frustrate this capacity. In this regard, issues such as the provision of gender needs, political strategies of exclusion and the unwillingness of agencies to divest control to local citizen-led institutions are examples that emerge from this research. Further, from a biophysical perspective, whether the goals a group sets for itself match the capacities and scales of the issue it is seeking to address emerges from this project as a further sustainability consideration. From an economic perspective, the interest of producers, namely farmers, in maintaining a certain level of production, regardless of the biophysical and social implications of human productive activities represents a further challenge to the capacity of accomplishing sustainability through CEM-style initiatives.

Together, what these insights imply is a need to go beyond simplified understandings of the form and function of CEM and its relationship with the themes of sustainability. The first part of this task involves what society understands as the form and function of CEM. In this regard, insights from the preceding chapters provide a set of valid and robust representations that can be drawn on as the foundations for a more inclusive (in terms of what they explain) and reflexive (in terms of the diversity of processes they represent) model of CEM. The notion of CEM as both a vehicle and an arena for environmental management, advanced from the findings in Chapter Six, is a case in point. As I have noted previously in this thesis, such understandings go beyond the narrative expressions of CEM described in Chapter Two (see Figure 2.1). As such they appear to offer better service as tools, from metaphoric notions, for understanding the processes and outcomes that imbue CEM within New Zealand.

Turning to the second issue, this involves the question of how society treats sustainability itself as a policy goal, two points emerge from this study that merit consideration in this matter. Firstly, as numerous scholars have argued, the concept of sustainability represents an agenda that is underscored by a set of assumptions of the human and physical world (e.g., Hilhorst, 2003). Because of this, Li (2001) argues, the promotion of sustainability can lead to certain interests and considerations taking precedence over others. Given this capacity, it seems important that the issues of purification and rectification I have described as problems for CEM are also recognised in the adoption of sustainability as a frame for human action. One means of doing this is to recognise that the focus of sustainability at the community level of society is underpinned by the livelihood needs of local actors. This is self-evident, for example, in the way that farmers rationalise their behaviour in the processes giving rise to the production first dilemma. Sustainability, in this sense, thus rests on local definitions of acceptable resource use, which may or may not reconcile with normative notions of the term. Further, attempts to create conditions that promote these normative conditions may illicit responses that undermine the capacity for environmentally beneficial collective action at the community level of society. A case-in-point is the anticipation that opening up the likes of the Barry's Stream group to wider stakeholder membership could have detrimental effects on local trust relations that, presently, contribute to positive collective outcomes (see Chapter Five). Because of this capacity, one must consider carefully how to integrate normative notions of sustainability with local human-biophysical environments. Any attempts at this are liable to yield hybrid notions of sustainability that represent a blend of normative and local conditions.

7.6 Conclusions: How and Why is Community Environmental Management Important to Sustainability?

Managing for the interactive elements of sustainability (see Figure 7.1) provides an enormous challenge for environmental managers. In the context of this challenge, CEM has been heralded as an approach that can integrate these elements and generate outcomes that are sustainable in form (e.g., Bernard and Young, 1997; Pye-Smith et al., 1994). However, while CEM would appear to circumvent some of the inadequacies of

other approaches, such as the narrow scope of participation in the command and control methods, findings from this study suggest that CEM arrangements will not naturally lead to sustainable outcomes.

Consequently, it appears that practitioners and students of environmental management need to be critical of pronouncements that infer a mutual relationship between CEM and sustainability. For example, as the observations of participation patterns in this research illustrate, CEM membership arrangements can involve courses of action that reinforce the exclusion of certain social groups from involvement in the management of an environmental system (e.g., anglers in Barry's Stream). Even amongst people who do find themselves participating in CEM activities, findings from this study demonstrate that there is no assurance that their practical and strategic needs will necessarily be fulfilled.

However, while such examples demonstrate the need for caution in using CEM as a tool for promoting sustainability, this is not the same as arguing that the relationship between the two is a failed project. For example, as numerous scholars have shown, methods that mobilise people into managing local physical environments often do give rise to advantages that command and control oriented approaches can or do not provide (see Dewitt, 1994). It therefore appears that what is needed is not only caution but also improved understanding of the theory, practice and research of CEM. In the next chapter, I discuss what the insights from this study can contribute to this endeavour, a task that will also allow me to re-visit the goal and objectives of this study.

Chapter Eight:

Discussion: Community Environmental Management in New Zealand – Implications of Study

As a Trust we are looking for why communities buy-in to landcare and that's the performance measure that we work on, and we are hypothesising from there that if we can get more people involved in Landcare then they are going to be carrying out action on the ground which equals improved environmental performance (Donald Ross, New Zealand Landcare Trust, March 2003).

8.1 Introduction

The statement at the head of this page, from the Chief Executive Officer of the New Zealand Landcare Trust (New Zealand's largest CEM programme), highlights concerns that lie at the heart of this study. These are, namely, that the implementation of CEM in New Zealand occurs within a policy environment of uncertainty and unqualified expectation. The goal of this study, in turn, has been to go beneath these metaphor-like images and draw out insights that can inform society about the 'reality' of processes and outcomes underscoring the operation of CEM. In seeking to discuss the findings from this exercise, the purposes of this chapter are two-fold. The first is to use the insights from this study to return to its three objectives and inspect the contribution they make to the theory and the applications of CEM within New Zealand (paraphrasing what these are, they entail an investigation of the form, function, contribution and theory of CEM). The second purpose is to discuss what the findings from this research reveal as theoretical, practical and research ideas that can contribute positively to CEM's effectiveness and efficiency.

Before turning to the first purpose, two qualifications to this discussion are necessary. The first is the recognition that at some points in the ensuing dialogue field-related issues are raised that have not featured in the preceding chapters. Although it is usual practice to avoid this in the discussion portion of a thesis, I have chosen to insert

this material here because these are matters ill-suited to presentation within any of the analytical chapters. Secondly, the iterative and 'grounded theory' qualities of this study have entailed the blending of observation and theory. As a consequence of this, at times, these two 'worlds' can become blurred in discussion; a trait that reflects the complexity of the subject matter and the nature of the approach used in this study. Efforts have been made, subsequently, to maximise the clarity between these two worlds by distinguishing between theoretical and applied matters in the ensuing sections of this chapter.

8.2 Towards a Theory and Model of Community Environmental Management in New Zealand

The diversity of CEM arrangements in New Zealand and the case study approach used in this research means that any attempt to use the insights from this project to define a theory and model of CEM must be treated with caution. Nevertheless, as Clayton (1998) argues, there is an expectation that even single instances of phenomena can inform and contribute to theories and models. Thus, although this research is limited in terms of the cases and the themes it explores, it does yield a series of inductive insights that are common across the six investigated examples of CEM. The re-occurrence of these findings suggest that there is an empirical basis for incorporating them into a set of theoretical propositions and a model that contributes to society's understanding of CEM. I will commence this task by highlighting a set of key tensions revealed through this study as affecting the form, function and contribution of CEM in modern-day New Zealand.

8.2.1 Tensions underscoring community environmental management

a. 'Command and control' or 'managing the leviathan'?

While CEM has been advanced as an alternative to the traditional command and control methods of environmental management (e.g., Dewitt, 1994), it is nonetheless apparent that elements of this paradigm persist in the arrangements explored in this study. Aspects of this include the control that Environment Canterbury and the Animal Health Board have retained over the overall decision-making apparatus in which the

Waitutu, Barry's Stream and Maine Valley groups have respectively been embedded. Concurrently, the reluctance of Animal Health Board staff to treat the experiential 'knowledge' of Maine Valley farmers on an equal basis with their scientific 'knowledge' is an output that reflects the qualities of this paradigm (see Torgerson, 1990). Considered together, the image acquired from this research is one in which the state, in the form of the above authorities, has persisted in maintaining a hierarchical dominance over the groups it has encouraged and interacted with. The resulting impression is of CEM *fitting* (rather than existing as an alternative) into a *hybrid* form of command and control administration.

Investigating these tendencies, recent research by Herbert-Cheshire (2000) has attributed them to efforts by the state to achieve 'government at a distance'⁸⁶. While this is one argument accounting for this tendency, a more pragmatic reason emerges from this research. Describing this, it is evident that the presence of the state in its command and control position has, at times, been operationally necessary for the accomplishment of the objectives by the groups investigated here (both their own and those of the agency). It is evident from the discussion on economic imperatives in Chapter Seven, for example, that without the state setting certain requirements, many farmers would not consider it necessary to undertake riparian projects to off-set the effects of their operations on local waterways (unless an economic benefit could be discerned from this undertaking). Further, the network role of the state as a supplier of goods and services, described in Chapter Five, indicates the importance of certain hierarchical exchange patterns to the operation of CEM groups, such as the Waimara example. Overall, what these insights suggest is that aspects of the command and control system (e.g., vertical relationships and control over decision-making) not only persist within CEM arrangements in New Zealand, but are necessary for reasons of operational efficacy.

⁸⁶ Based on experiences in Australia and the theoretical inputs of Foucault's notion of governmentality, Herbert-Cheshire's (2000) argument is that community-based methods have provided a vehicle through which the state has been able to divert the responsibility for environmental management, while retaining its position of power.

What is also equally evident from this research, however, is that the institutional arena CEM creates (see Chapter Six) provides a space in which other actors can assert their social claims of the material world on to both it and other actors. Because of this, I do not believe that the operation of CEM in New Zealand represents a case of 'business as usual' for the command and control paradigm but rather, in the title words of Paehlke and Torgerson's (1990) edited work, a case of 'managing the leviathan'. For example, the way farmers have been able to negotiate and influence the imposition of riparian management strategies onto the physical landscapes of the Waitutu and Barry's Stream catchments is illustrative of this process. By controlling the shape of these strips, for instance, they have ensured partial protection of their social nature concerns, including those associated with the assertion of their productive interests.

Despite these moderating tendencies, the tensions that arise from the rudiments of the command and control approach do pose numerous challenges to the on-going pursuit of CEM. In particular, observations from the three productive-oriented initiatives intimates at the uncertainty that can arise over what an effective course of action for a CEM group may be. A case-in-point is the uncertainty in the Maine Valley case over whether the focus for vector control should be the ferret (group argument) or the possum (the Board's argument). Moreover, the mixed roles of authorities (e.g., facilitators of CEM and regulators) and the problem of issue loading, emerge from this investigation as processes that can undermine communicative and co-operative relations between the state and local communities. The resulting situation, as one Environment Canterbury employee recounted, creates an uneasy balancing act for the state, in terms of managing their relationships with different groups, those of other stakeholders and the accomplishment of their statutory functions (Interview, November 2002).

b. Discursive tensions – the meaning of 'community', 'environment' and 'management'

An emergent element in this research is the evidence of tension residing between normative descriptions of 'community', 'environment' and 'management', and the relationships within the six CEM case studies. Starting with the notion of community, it

is evident from this investigation that the influences of such variables as political processes, social norms and rules, and trust arrangements precipitate a different image of the term from those traditionally portrayed in the literature (i.e., as a unified, organic whole). In this study, the processes described above contribute to a non-inclusive notion of community, wherein participation is linked to a combination of variables not usually distinguished in normative descriptions of community (see Thompson, 1971). These include the relevance of shared nature claims and strategic practices that control who does and does not participate in a group (see Chapter Six). The subsequent failure to recognise and attend to these differences has, this project demonstrates, contributed to conflict and uncertainty, as expectations and outcomes have often failed to align between stakeholders. A case-in-point was the previously cited conflict that arose between a Barry's Stream angler and farmer, from the public expression of concern by the angler, at the latter's (from the angler's perspective), slow pace in dealing with the impact of farm stock on the waterway (see Chapter Six).

A similar discursive tension underlines the notion of 'environment'. The social construction of nature chapter highlighted the concept of 'environment' to be more dynamic and relative one than traditional, static, realist images suggest. The instability of the concept, especially across actor groups, provides a fertile space for misunderstandings and conflicts, the above example from the Barry's Stream study providing an apt illustration.

The term 'management' also does not escape from the capacity to precipitate tension. Exploring this further, conventional appraisals suggest environmental management involves efforts to control the effects of human activities on the physical environment (Beale, 1980). This is a perspective that New Zealand's primary environmental legislation (the Resource Management Act) reiterates in its statutory purpose (see Memon, 1993). Findings from this research suggest that the concept is more complex than this however, and carries subjective qualities that generate questions about *whose* environment is being managed for by a particular initiative. Further, observations here suggest management is not solely about influencing what occurs in the

physical world, but also the social, political and economic worlds as well. Management, in this sense, therefore needs to be appreciated as entailing both physical and socio-political dimensions; the former concerned with the means of asserting one's meanings onto the physical environment, the latter with their imposition onto the human world.

c. Expectations versus capacity

In the popular policy and planning literature, a prevailing assumption is that communities represent an under-used or limitless resource for environmental management (e.g., Environment Canterbury, 2001; Environment Southland, 2000; Waimakariri District Council, 1998). In tandem with this assumption, findings from Chapter Seven also demonstrate how CEM groups can set physical goals that are inconsistent with the states of the human-biophysical systems they are seeking to manage. Linking these observations together, I suggest that expectations can attach themselves to CEM that do not align with the capacity of people or the human-physical environment to meet them.

This lack of alignment generates a tension within CEM that I summarise as the 'expectation-capacity' divide. Factors that contribute to this divide identified in this research include: (a) the limited capacity of human-biophysical systems to adjust to meet different people's expectations (see 7.2.2); (b) difficulties in addressing scale issues (see 7.2.3); and (c) constraints imposed by social structures and local norms (see 6.3); (d) the influence of certain economic imperatives (see 7.4); (e) limitations in group resources (see 5.3.2). In addition to these, the retroactive position CEM groups often operate in, that is dealing with biophysical problems that already exist, confronts them with a number of difficulties. This is not only the problem of seeking to repair the physical cause of a problem (see 7.2.3 and Howard-Williams and Pickmere, 1994) but also the need of appeasing various stakeholders, whose expectations of positive change can be set at levels that are beyond the capacity of community organisations and biophysical environments to meet. This situation was again evident in the Barry's Stream study, where aggrieved anglers demanded that local land users restore the waterway as quickly as possible. This was a demand that was out of sync with the dimensions of the physical

and social issues in the catchment itself. Together, what this list of factors highlight is the challenge facing the reconciliation of expectations of different stakeholders with the capacities of natural systems and people. The subsequent differences engendered by this divide provide a fertile ground for inter-actor tension within and around CEM groups.

d. Ecological versus socio-economic imperatives

It is apparent from the discernments above that a key tension underscoring CEM exists between balancing ecological factors against an array of social and economic forces. These contributions to tensions can inhibit the capacity of CEM initiatives to contribute to biophysical sustainability, a point highlighted within the preceding analysis of the production-first dilemma. As a tension, it is additionally interesting for what it reveals in terms of the oft-cited analogy, 'the tragedy of the commons' (Hardin, 1968). The themes in the 'tragedy' are often invoked by *common property institute* scholars, who have tended to frame their theoretical arguments as rejoinders to the human tendencies captured in it (e.g., Ostrom, 1990).

Exploring this argument, at the centre of the 'tragedy' is the contention that under strategies of self-interest, individual actors will behave in ways that degrade open access resources, such as marine fisheries (Hardin, 1968). In response to this environmental dilemma, common property institute theorists have contended that property relations, grounded in certain pre-conditions and design principles can circumvent these impulses (e.g., Ostrom, 1990). What is evident from the tension between ecology and the other imperatives observed in this study, however, is how certain social and economic elements can encourage collective activities that perpetuate the physical degradation of environmental systems.

Drawing on the findings from this study, aspects that contribute to this include, firstly, the capacity for different social meanings to be attributed to the environment (including common pool resources) and environmental change. A relevant example here is the way farmers from the Barry's Stream and Waitutu catchments had not traditionally acknowledged that the presence of silt in a waterways as a concern. By way of contrast,

within the common property institute narrative the capacity for interpretative differences about the meaning of the environment are not recognised as a causative element in human collective behaviour. Instead, the central issue within this narrative is the development of instruments that control the individualistic tendencies of humans (e.g., through the development of design principles). The interpretative processes revealed through the analysis in Chapters Five and Six, however, demonstrate the limited nature of this argument. They do so by illustrating how different social constructions of nature and nature change can facilitate collective activities, which are inconsistent with sustaining the integrity of natural systems.

Moving to the arguments raised in Chapter Five and Seven, it is also apparent that elements of social norms and structures can inhibit the management of common pool resources, leading again to outcomes of ecological degradation. An example is how norms and social rules in the Barry's Stream and Waitutu catchments encourage residents to clean their drains on a biennial basis, with a 'clean' drain being symbolised by the presence of a large collection of spoil on the drain's bank. However, neither this regularity of cleaning or its extent are complicit, Environment Canterbury staff have argued, with protecting the ecological state of these waterways or the systems they feed into (e.g., Barry's Stream) (Interview, November 2002). Despite this recognition, it is equally apparent from my case study discernments that existing drain management practices in the Barry's Stream and Waitutu locations were shaped around the expectations, associated with the presiding norms (e.g., the expectation that a person should clean their drain regularly) and social structures (e.g., local by-laws requiring drains to be legally cleaned regularly) of these localities. In the parlance of the 'tragedy', avoiding it in these situations appears socially difficult.

e. Metaphors versus policy prescriptions

In Chapter One, I described the concern arising from the use of metaphor notions of CEM as the basis for concrete policy formulations. To reiterate, CEM metaphors were argued to comprise descriptions presenting simplified or idealised models of this approach. In returning to this issue, it is evident that while using metaphors to describe

CEM creates difficulties, their application does also have a utility value. The recognition of these points to a methodological tension within environmental policy over where and when metaphoric descriptions of policy, as opposed to prescriptive accounts, are acceptable and desirable.

Underscoring this tension is the recognition that metaphoric descriptions of CEM perform a useful task in summarising the complexities of this policy approach to a broad policy audience. Li (2001), for example, notes that the use of metaphors within CEM policy is a useful device for building understanding and acceptance of the approach by decision-makers. Similarly, simplistic descriptions of CEM have permitted Environment Canterbury staff to explain the rudiments of its resource care work to the wider rate-paying public (see Environment Canterbury, 2003). In these contexts, policy metaphors appear to perform a useful utility function as a device for describing a policy approach to a non-specialist audience.

However, observations from this project indicate that tensions arise when CEM metaphors are used, in plans and strategies, as substitutes for more prescriptive models. In such contexts, the abstract qualities of these metaphors, which make them useful as general descriptors, create difficulties. This is because they lack the specificity to cope with the micro-social processes observed in this research account. Nevertheless, in the course of this inquiry it appears that it has been metaphoric notions of CEM that have been carried into the policy arena. From the findings in this investigation two factors emerge to account for this.

The first has been the tendency for CEM, in New Zealand generally, to develop in an ad hoc and incremental way, unattached to any clear theoretical frames. As a consequence of this, there has been little recourse to a theoretical framework on which CEM has been able to be 'fleshed out' into a concrete policy concept. Secondly, a lack of critical evaluative research within New Zealand on the accomplishments of CEM has meant that the shortcomings of relying on metaphoric understandings have tended to go undetected. Thus on review, it is evident that aspects of CEM's recent development and

implementation in New Zealand have encouraged the dominance of metaphoric images over expressions that are more concrete. As noted here, this has become a cause of tension when these former expressions have become foundations for on-the-ground institutional arrangements. From this discussion of the tensions that inhabit CEM, in the next section I discuss what these and other points raised from this thesis suggest about the forms that CEM conspire to take in New Zealand.

8.2.2 The form of community environmental management

From the perspective of the form CEM takes in New Zealand, observations from this inquiry suggest that it is characterised by five interrelated factors. Firstly, compared with the emphasis in overseas initiatives, such as the Australian Landcare Programme, the groups in this research have not been inclusive of a range of environmental stakeholders⁸⁷. Instead, membership has typically centred on particular producers (e.g., farmers) or those with a socially related interest in a physical system (e.g., anglers). In accounting for this pattern, several causative elements emerge as explanations from this research. These include: (a) the desire of certain actor groups to exclude the participation of certain parties and thereby reinforce their political position through the control they enjoy over a CEM group; and (b) the decision by certain actor-groups to opt-out of particular CEM arrangements because they do not provide for their practical or strategic needs. In addition to these covert factors, an overt matter also helps to account for the non-inclusive patterns observed amongst the productive-oriented groups in this study. This factor was the tendency for membership to be defined through compulsory institutional mechanisms. In the Waitutu case study, for example, membership was defined by a farmer holding a water use permit from the local regional council, while in the Maine Valley case the ownership of bTB vulnerable livestock (i.e., cattle and deer) was the variable that defined membership. In contrast, similar compulsory criteria were not observed as determinants of membership inclusion amongst the social-oriented groups.

⁸⁷ The term diversity is used in this sense to denote a situation where an array of different actor groups is involved in a group (e.g., farmers and anglers, women and men).

Secondly, whereas major CEM programmes in Australia, the United States and the United Kingdom have been linked to wider national policy objectives, with the exception of the Maine Valley group, those in this study *have not* (c.f., EPA, 1997; McHenry, 1998; Yencken and Wilkinson, 1998). Instead, the image from this research is of local groups responding to locally defined problems within a narrow policy context. In accounting for this, observations from this research turn attention to two matters. The first, consistent with the *new social movement* narrative, is that CEM within this study has been partially about people conferring their meanings on to local landscapes (human and material). In this context, the necessity of linking to national strategies cannot be considered an automatic imperative for individual groups. Thus, while lip service maybe given to national and international agendas such as sustainability, what is important to these groups is how CEM links to their meanings.

As a qualification on this point, when considering the Barry's Stream and Waitutu case studies, it is evident that while aspects of the above argument are relevant to them, it is also apparent that they are dealing with environmental issues that are nationally important (e.g., water quality). Because of this, one would anticipate the existence of wider national programmes into which local regional managers could seek to integrate these groups. However, in New Zealand, such national programmes generally do not exist. Reasons that account for this include: (a) the incremental response by local and national state agencies to environmental issues; (b) a reluctance by the state to question the imperatives and design of productive systems in New Zealand; and (c) financial constraints (see Hughey, 2001). A resulting outcome of this combination of factors has been a narrow focus for environmental management, which has permeated through to affect strategies and methods for environmental management (PCE, 2002).

The third characteristic distinguishing the function of groups from this research has been an overt emphasis on *biophysical* ends (see Waimakariri District Council, 1998; Environment Canterbury, 2001). This focus contrasts with numerous expressions of CEM from Africa and Asia, which have explicitly linked biophysical goals with

socio-economic and political objectives (e.g., Hulme and Murphree, 2001; Western and Wright, 1994). Memon (1993) suggests that this tendency has come from the focus, in the Resource Management Act, on the managing of the physical impacts of resource use, and an overt resistance to extend environmental management into the realms of social and economic planning. One must be careful with this argument, however, as other bodies (including a state ministry, the Ministry of Economic Development) have been established to champion the promotion of economic development in New Zealand. Further, the recent initiatives in 'triple bottom line' reporting and amendments to the Local Government Act (1974) (via the Local Government Bill [2002]) do place an emphasis on economic and social parameters, as well as biophysical environment, in planning.

However, as the recent report of New Zealand's Parliamentary Commissioner for the Environment has indicated, a scan of the statutes that cover social and economic matters reveals that none of these incorporates the notion of sustainability as a parameter, suggesting "... *sustainable development may be perceived and categorised as only an environmental management issue*" (PCE, 2002, p. 9)⁸⁸. This approach appears to have filtered through to affect overt images of CEM in New Zealand, with the use of initiatives being thought of as a tool for accomplishing physical ends that are not explicitly linked to peoples' social and economic well-being. What is equally noteworthy from this study, however, are the subsequent processes actor groups have employed to reconcile the physical objectives of CEM with their social, economic and political needs. This has included, for example, the upholding of economic imperatives in the face of pressures for physical change (in the case of the productive-oriented groups).

The fourth distinguishing characteristic of CEM identified through this investigation relates to the way the approach itself has evolved since the mid-1990s.

⁸⁸ Since this report was written, amendments to the Local Government Act (1974) make use of the word 'sustainable', referring to it in the context of social, economic and physical parameters. Interestingly, however, the definition of sustainability differs from the concept set out in the Resource Management Act (1991).

What is discerned here has been the lack of recourse to critical evaluative research as a means for assessing and refining the implementation of CEM. In contrast, a distinguishing feature of CEM programmes in Australia, the United States and Africa has been the enormous effort undertaken to review these by scholars and practitioners (e.g., Falconer, 1998; Leakey and Pelkey, 2001; Songorwa, 2000)⁸⁹. The information supplied by these investigations has yielded insights that have identified means for improving the efficiency and efficacy of CEM programmes.

In contrast, this cycle of evaluation and adjustment was not a characteristic revealed in this study of CEM in New Zealand. The impression gathered, instead, is that in New Zealand CEM is premised on the principles of 'muddling through' (Lindblom, 1980), where policy is refined incrementally on the basis of what works and what does not. Reasons accounting for the paucity of critical CEM research identified from this study include: (a) a lack of skill and willingness to undertake evaluative research by those charged with overseeing the operation of CEM groups; (b) unwillingness of groups to evaluate 'themselves'; (c) lack of base-line data against which to evaluate group performance; (d) difficulties created by the problem of attribution (see Chapter Three); and (e) the inability to identify appropriate evaluative indicators (Fieldwork, August 2000 - March 2003). The comments below, from my interviews, capture some of these themes:

Now they go and plant that [stream] . . . you say to them 'right, now you have got to get in the creek and every month or six months and measure water quality', they will tell you where to go. That's the reality of it, you can't get landowners to do that (Don Ross, New Zealand Landcare Trust chief executive officer, March 2003).

No, we haven't relied on monitoring as a major tool. We have relied on getting out there and putting a spade in the ground and keeping an eye on it (Member, Waimara, November 2001).

The lack of critical evaluative research has, I suggest, had various consequences for the development of CEM in New Zealand. It has, for example, perpetuated

⁸⁹ To qualify this point, the results of such studies have not always been subsequently incorporated into CEM programmes (e.g., Songorwa pers. comm., July 2003).

ambiguity and uncertainty over the accomplishments through the approach. Because of this it is difficult, early in the twenty-first century, to discern what contribution CEM has made to the nation's biophysical well being. Further, the absence of critiques has allowed CEM to be drawn on by different sector stakeholders to support their environmental claims, without the hindrance of *informed* counter-claims.

In the resulting vacuum of critical understanding, two things have emerged to occupy the resultant space. The first has been an emphasis on outputs rather than outcomes as an indicator of CEM performance. A common instance of this is the reference to the growing number of CEM groups and initiatives operating in New Zealand within evaluative reports (e.g., Warren and Proctor, 2000). Such data, of course, say little about what has been biophysically accomplished by the presence of these institutions. The second, linked to the first variable, has been the reversion to a '*celebrate not evaluate*' tendency amongst administrators, which I described in Chapter One. The resulting absence of critical review and understanding engendered by these practices has, I contend, made it difficult to recognise and implement means to improve the efficacy of CEM groups.

Finally, when this list of form variables are considered together, the impression garnered of CEM is of a *hybrid* institutional arrangement that varies from the normative qualities of those expressions presented in Chapter Two. In stating this, the point is not to deny that thematic aspects of, for example the *community* and *participation* narratives, exist in the groups I have investigated. What I mean here is that the groups encompass aspects of all four expressions, without falling easily into any one narrative categorisation. What appears to underscore this pattern of hybridity is the need for the practice of CEM, at the level of the human actor, to accommodate the biophysical political, social and economic needs of a variety of different peoples within different contexts. Because of this CEM emerges as entailing more than efforts to manage physical systems, it is also revealed to embrace the management of social meanings and other aspects of the human world that imbue a temporal and spatial setting. As a consequence of this, what we know as the Hague Stream initiative, in 2003, needs to be

understood as something that has been shaped by factors that range from the local (e.g., social norms) to the transnational (e.g., market imperatives). Further, this appreciation itself is likely to vary in accordance to who is contemplating the initiative, a factor that highlights the relevance of symmetry to CEM research. From this discussion of CEM's form, I now move onto what the findings from this investigation suggest about its functions and contributions.

8.2.3 The functions and contributions of community environmental management

a. Function

The findings from this research highlight the multi-variant functions that CEM arrangements perform within the New Zealand context. What is interesting about these is how they extend beyond the traditional normative image of CEM's function (e.g., see Figure 1.1). In such images, the functions of CEM are portrayed as the management of biophysical issues, either in the form of allocation matters (e.g., water allocation) or the management of particular biophysical problems (e.g., waterway degradation). At an overt level, the various groups in this study do indeed perform these functions. The Maine Valley group, for example, addressed the biophysical problem of vector-borne bTB, while the Hague Stream group sought to manage for issues relating to habitat suitability for chinook salmon. In the case of the Waitutu Abstractors Group, meanwhile, this organisation transformed itself from a strictly allocative-oriented arrangement to one, in 2003, that also embraced issues of habitat degradation. While the performance of these functions fits into the normative frames of what the tasks of CEM are commonly construed to involve, insights from this study suggest that beneath them, at a covert level, are a number of other functions that usually go unrecognised. The nature and diversity of these attest to what Agrawal and Gibson (2001) have described as the heterogeneity of CEM.

Drawing some of these out, they include the political ends that different actors have sought to accomplish through their participation in CEM arrangements. An instance from this study is the aforementioned way that farmers from the three productive-oriented groups have used their involvement in CEM initiatives to assert

their meanings onto their local physical and institutional landscapes (see Section 6.3.3). It is apparent from the observations in Chapter Five, meanwhile, that a further function of CEM is to offer an institutional setting in which aspects of local social relationships (e.g., trust and social norms) can be mobilised for environmental ends. Conversely, observations from Chapter Seven suggest that the oft-cited function of CEM, to promote sustainability, must be assessed critically. For example, as revealed by processes described in my case studies (e.g., the production first dilemma), effects on human behaviour can arise that generate contradictions between the normative goals of sustainability and the outcomes yielded through CEM initiatives.

b. Contribution

Distinguishing the contribution CEM makes to environmental management involves re-visiting elements from the preceding sections and considering them from the perspective of positive and negative effects. In this regard, the first of the positive contributions that CEM has made recognised through this study has been the provision of an institutional environment in which aspects of community-levelled social relations have been mobilised *and* managed for collective ends. For example, as illustrated in the instance of the three productive-oriented groups, the presence of trust, norms, rules and network relations have contributed to many of the accomplishments of these organisations. Concurrently, the six arrangements have also provided fora for the staking of nature claims and a vehicle for their assertion. Therefore, from the perspective of the social-oriented groups, stakeholders traditionally removed from the management of particular environmental systems have been provided with the opportunity to assert their social nature interests.

An illustration here is the way that an actor from the Waimara group was able to respond affirmatively to his concern about the demise of native fish habitat around the local estuary by encouraging the CEM group to engage in the development of such habitat. Further, and at times simultaneously, those who have had their traditional nature claims threatened by processes, such as rural re-commodification, have been able to draw on the opportunities afforded by CEM to defend these. The way Barry's Stream

residents sought to integrate their meanings into Environment Canterbury's strategies for the management of local riparian environments demonstrates this (see Section 6.3.2).

Although at times only partial, the six groups have also enhanced opportunities for citizen participation, and in particular the capacity of certain actor groups to meet their practical and strategic needs. These have included needs associated with the assertion of social nature claims described in the preceding paragraph.

In addition, it is a valid argument that each group has made a positive contribution to ameliorating some of the effects of the human exploitation of local environmental systems; although at times, as in the Hague Stream and Waimara studies, the form or level of change has not matched the expectation of group members. More decisively, turning to the example of improved water clarity change in Barry's Stream (see Figure 4.4) it appears that this group has made a significant contribution to the condition of its local waterway in terms of the concerns of various stakeholder groups (e.g., anglers).

Beneath these features, it is also evident that CEM has provided a service in defusing local conflicts. It has done so because, working through groups, it has been possible to accommodate and manage local norms, nature claims and social structures while, often covertly, adjusting people's behaviour. The example of the enrolment strategies Environment Canterbury has developed to gradually transform the behaviour of Barry's Stream and Waitutu farmers towards their local waterways is an example. CEM, in these situations, has also provided a safety valve, which has reduced the pressure that the processes of land re-commodification presently generate in New Zealand (see Perkins, Forthcoming). These include, for example, the contrasting claims engendered through conflicting productive and consumptive interests' in particular rural landscapes. In this pluralistic environment of contrasting nature claims, CEM has provided an institutional fora for the balancing and adjustment of different stakeholder claims, and the channelling of peoples' energies into positive patterns of collective action rather than disruptive conflicts. In providing this service, CEM has served as an agent of

reflexive ecological modernisation, a process whereby actors seek to meld their actions around the imperatives of the modern world (Kortelainen, 1999).

From a negative perspective, numerous factors emerge from this research that indicates how efforts to manage the environment can be frustrated through the operational tendencies of CEM groups. From a social capital perspective, for example, it is evident that elements of this variable, such as the interactive patterns of social norms, can conspire against the collective objectives of an initiative. The episode revolving around social norms, rules and the presence of certain bTB vectors in Maine Valley is an instance of this that I have highlighted previously (see Chapter Five). Collaterally, there is also no assurance, as insights from this investigation suggest, that local social relations will yield the goods and services necessary for accomplishing pre-described environmental ends.

Interpreted differences in the construction of nature have also, as illustrated in examples from Chapter Six, contributed to tensions that have undermined the extent that group activities have redressed environmental problems⁹⁰. The cited example of how different social interpretations have impacted on the size and shape of riparian strips is a case-in-point. As I indicated when discussing this impact, the tendency of farmers to reduce the areas put aside as fenced strips has subsequently impacted on the physical efficacy of these measures as a means for addressing waterway degradation.

The non-representative character of community initiatives, revealed through the analysis in Chapter Seven, can also give rise to a series of negative implications for CEM. The non-inclusion of certain stakeholder groups from decision-making roles can, for example, confound efforts to promote participatory democracy and the benefits that are argued to accrue from it (see Carr and Halvorsen, 2001). These include deliberative and mutual learning, and movement of decision-making beyond compromise solutions. The exclusionist tendencies revealed in the examples of the Hague and Barry's Stream

⁹⁰ It is necessary to recognise that this theme is context specific, thus what is considered a 'failure' by one set of actors will not necessarily be construed as so by another.

organisations, meanwhile, mean that these groups have been deprived of access to the scientific and local knowledge of the North Canterbury Fish and Game Council and local anglers respectively, as well as the goods and services these actors could have provided (see Chapter Five).

A number of factors observed in this study are also observed to frustrate the promotion of sustainability through CEM. The instances of the internalisation and production-first dilemmas set-out in Chapter Seven, for instance, highlight two processes that complicate the ability to reconcile human expectations with the normative goals of sustainability. Pragmatically however, it is difficult to deduce how the human processes identified in these dilemmas can be readily accommodated for within a strategy that aligns CEM with sustainability. For one, it is reasonable to anticipate that group members will wish to sustain their livelihoods, regardless of the medium to long-term ecological consequences of this (for example, see Cocklin et al., 2000). Thus, while CEM can provide an instrument for minimising ecological change, observations from this research indicate that economic factors will invariably take precedence over biophysical concerns in the priorities of individual action where productive imperatives are at the centre of participant concern (i.e., the productive-oriented groups in this study).

One means of circumventing the above tendency could be through the establishment of clear goals, objectives and strategies for environmental management in New Zealand. This could provide an alternative agenda, with appropriate enforcement, to individual strategies of action. At present, however, such mechanisms are generally absent from the nation's environment management regimes, although certain problems - most notably the issue of biodiversity decline - do have their own strategy (see Department of Conservation and Ministry for the Environment, 1998). Further, within the over-arching neo-liberal reform setting, which has encouraged the devolution of responsibility downward to the regional and local level and the organisation of human action around profit-maximising behaviour, the likelihood of such developments in the immediate future appears unlikely.

Given the above tendencies, I suggest that it is fair to argue that CEM in New Zealand is presently party to a policy environment where fundamental questions about the relationship between New Zealanders and their physical environment are treated in an incremental and ad hoc fashion. In this sense, therefore, CEM is complicit in a process where the fundamental issues underpinning the nation's environmental future go unchallenged. This was a point reiterated to me by Morgan Williams, New Zealand's Parliamentary Commissioner for the Environment, when he noted in an interview:

I think a lot of our environmental action is still, not surprisingly, on cleaning up effects [but] . . . the solution is going to be going back to design of the farm systems in many places (February 2003).

Examining this trend more closely, it appears that a covert contribution of CEM is thus its capacity to divert people's attention and energies from challenging the root causes of New Zealand's environment problematique⁹¹. As a rejoinder to this it could be argued that CEM represents an opportunity for social learning and individual action that could lead to a 'public critique' of the nation's environmental situation. However, my observations did not indicate progress in this direction within the time frame of this study.

Moving on from these points, the insights from the preceding discussion can be used to set forward a series of theoretical propositions and a model that captures qualities of CEM revealed through this study. In the next two sections I explore what this study suggests in terms of these two factors.

⁹¹ Ritchie (1996) and Daniels (1992) respectively attribute this crisis to the growth needs of capitalism and the inherent limited capacity of physical systems to accommodate this (in both resources and waste assimilative capacity).

8.2.4 Contributions to a theory of community environmental management

From the inductive insights derived from my six case studies it is possible to define a set of theoretical propositions about the form, function and contribution of CEM in New Zealand (i.e., the objective themes of this study). The key theoretical propositions from this research are summarised in Table 8.1, with the distinguishing feature emerging from this table being the recognition that its contents represent a melding of overseas experience and different theoretical descriptions. This highlights what I argue to be the hybrid quality of CEM within New Zealand; that is its reflection of different theories and practical expressions of CEM.

Consequently, it appears inappropriate to directly link the notion of New Zealand's present CEM experience with any of the theoretical narratives summarised in Chapter Two (see Table 2.1). Instead, the over-riding theme emerging from these propositions is how the contemporary expressions of CEM within this country have evolved out of the convergence and interaction of human and non-human elements within local contexts. This has occurred as different people and organisations have looked at ways to address local and personal issues associated with environmental allocation, change and decision-making (in 8.2.5 a model is advanced that seeks to explain the dynamics behind this process).

Given the acknowledgment of these hybrid qualities it appears difficult, even dangerous, to suggest that the groups from this study can be incorporated into a typology that accommodates all their attributes or the different perspectives that attach to them. The issue behind this concern is that typologies tend to solidify 'things' into a set of parameters, which may disguise both the complexity and relativity of this categorisation. In the case of CEM here, to be truly inclusive a typology would need to be either very broad in its category descriptions or inclusive of a range of categories that capture the nuances of the approach. Both of these outcomes seem at odds with the purpose of a typology, which is to simplify our understanding of how things fit into the world. Given these arguments and the diversity that appears to beset the CEM approach recognised in this study, I have resisted developing a typology for it from this work. Nevertheless, I

Table 8.1: Contribution to theory: Form, function and contribution of community environmental management – case study insights

Form of Community Environmental Management

- **Non-inclusive in terms of stakeholder membership**
- **Seldom part of an integrated policy approach**
- **Has overt and covert dimensions that differ from and combine aspects of overseas and existing theoretical expressions of CEM**
 - **Emphasis on biophysical ends**
 - **Lack of critical evaluation**
- **Recent Development has reflected an incremental and ad hoc approach to environmental issues**

Function

- **Means for addressing issues of environmental allocation and change**
- **Vehicle for the assertion of actor social meanings onto the human and non-human world**
- **Institutional setting for the organisation and mobilisation of social relationship variables into patterns of desired collective action**
- **Capacity to promote sustainability under certain conditions (e.g., operating *within* the prevailing states of human / non-human systems)**

Contributions to Environmental Management

Positive

- **Provides fora for mobilising and directing social capital towards environmental objectives**
 - **Capacity to manage for perturbations within biophysical systems**
 - **Defuse conflict between environmental stakeholders**

Negative

- **Aspects of social capital can conspire against the efficiency and effectiveness of CEM arrangements**
- **Tendency towards single images of environment and environmental change can obscure interpretative differences that subsequently become a source of conflict**
- **Capacity to reconcile human and non-human elements limited by the effect of different processes (e.g., the effects of the 'production-first' dilemma)**

can offer some ideas garnered from this research, of potential typologies that could be applied in future research accounts seeking to characterise CEM in New Zealand. I have summarised some potential typological categories that could be applied to describe CEM in Table 8.2. Each category emphasises one particular aspect of CEM, although no one theme can be said, observations from this study suggest, to accurately capture the intricacies of the approach.

Table 8.2: Potential typologies for community environmental management – ideas from the case studies

Theme	Potential Categories
• normative management focus	allocation, change, decision-making
• stakeholder diversity	single, multiple
• biophysical media	water, land, air
• issue range	single, multiple
• time-frames	short, medium, long-term
• needs addressed	practical needs, strategic needs
• integration	part [or not] of a local, regional, national programme

8.2.5 A model for community environmental management

In considering the format of a model that can capture the emergent themes from this research, it is necessary to contemplate a means of showing how the various processes that it entails interact together. These include, for example, how social capital attributes conspire to affect the effectiveness and efficiency of collective action. The consideration of how these variables arise within a model alters the syntax of the questions that we need to ask of CEM, from the past tense of ‘what happened?’ to the present progressive of ‘what is happening?’ (Deutscher, 1977).

Observations from this study indicate that the parameters that this approach to model building need to embrace involves the following traits: (a) it needs to reflect the capacity of human and non-human elements to contribute to the processes, activities and outputs of CEM; (b) it needs to make the distinction between these attributes and the

outcomes derived from them; and (c) it needs to acknowledge the contextual relativity of all of these elements within space and time. A model that integrates these elements is presented in Figure 8.1, with a description of its qualities following in the next paragraph.

In demonstrating the functions of the model, as well as its origins within the content of this study, the following points are relevant. Firstly, the notion of ‘human worlds’ in the model builds on what I have formerly described in Chapters Five and Six. From the analysis in these chapters, it is understood that factors such as social norms, trust, social structures and individual agency make a central contribution to the processes and activities associated with collective human behaviour within and around CEM institutions in this study. In concert, the ‘non-human’ category incorporates such variables as the role that material nature can play as an ‘actor’ in the social construction of environment and environment change (see Chapter Six). The way, for example, that the susceptibility of ferrets to bTB has influenced the meaning given to them (and action towards them) by Maine Valley farmers being a case-in-point. In the model, the connecting of these two worlds (see the linking arrows), depicts how elements between them interact to affect the processes, activities and outputs I have described in this study.

Again, the way the environment and environmental change are socially constructed and responded to are cases-in-point, with the example of riparian zones having been specifically explored in this study (see Chapter Six). In this example, factors relevant to different actor groups, such as structural forces (e.g., local by-laws), normative expectations and the material opportunities and challenges these zones create relative to actors’ roles and identities, contribute to how these physical spaces are acted towards.

The loop from the processes, activities and outputs section of the model back into the human and non-human components, meanwhile, captures the capacity for these variables to feedback to affect items in both of these worlds. An example of this feedback process has been the way that the *enrolment* processes used by Environment

Canterbury have influenced the way landholders in the Waitutu and Barry's Stream localities have come to re-interpret the implications of silt releases into their local waterways. With this re-interpretation, has subsequently evolved a change as to what is normatively acceptable behaviour in terms of allowing stock to enter a watercourse amongst respective landholders from these groups.

The double-headed outcomes arrows, pointing out from these domains of interaction reflects the capacity of CEM to produce outcomes that are social, economic and biophysical in nature. The broken circle that these arrows pass through, in turn, signifies the contextual nature of CEM; whereby the variables present in the model are appreciated as varying through time and space. This capacity for variation is represented in the figure by the inward and outward arrows, which indicate the capacity of space and time to change depending on the actor whose perspectives are captured by the processes occurring inside it. Returning to the outcome arrows themselves, these differ from the process, activities and output items inside the circle in terms of what they signify. Using an example to demonstrate this, while an activity may involve removing stock from a stream and the subsequent output of this might be less silt in a waterway, the outcome will be a change in water quality and habitat health. It is these latter consequences, the outcomes, which are usually of immediate interest to practitioners who turn to CEM as a means of addressing environmental issues.

In stepping back and contemplating the various nuances of the model, three related factors emerge. The first of these is how its various linkages and feedback loops replicate the qualities of an ecological-like process. For this reason, I believe that the model reveals what can be described as the *ecology* of CEM.

Secondly, it is apparent within the model that the human actor is the dominant social unit around which the various functions within it operate. With this acknowledgement comes the understanding that human action is *meaningful* rather than something that is predetermined through structural forces (Jones, 1999). From here, it can be understood

Figure 8.1: The 'ecology' of community environmental management – a heuristic model

that human action, as represented in the model, is something that is ordered across space and time in accordance to interactions between human and non-human variables.

The third distinguishing quality of the model is the importance that relativity plays to the processes summarised within it. This not only involves relativity from the context of space and time, but also from the perspective of the actors within the model. By way of an example, from the Kemp's Drain study I have described the prominent role of two actor groups, anglers and regional council administrators, in the events associated with its operation. Each of these was beset by different influences within what is noted in the model as the 'human world' (e.g., identities, roles, influence of social structural variables, individual agency). Given these differences I have indicated in the preceding chapters how each actor group's interactions differed in accordance to the influence of these factors and the way they interacted, in turn, with the 'non-human world'. In order to appreciate these differences the principle of symmetry is a necessary tool for those who come to use the model. Using the principle, the interest is not in judging peoples' actions but in understanding them from their point of view. To assist in verifying this model and show how it can contribute to the theoretical and practical understanding of CEM, I run one of my case studies through it, below, to illustrate its operation in an applied setting.

Again, using the Kemp's Drain group for this purpose, a combination of human and non-human factors can be discerned to have contributed to the processes, activities and outputs of its members. From a human perspective, for example, participant angler identities underscored their interpretations and intentions for the waterway and their involvement in the CEM initiative. From the non-human perspective, the physical capacity of the drain as a trout fishery was an important factor drawing the focus of these actors to this physical system and in socially constructing their subsequent responses towards it.

Inspecting how these factors interacted together, the physical appearance of the waterway after maintenance work undertaken in 1986 (see Figure 4.4) appears to have

been a key contributor to it being interpreted as 'degraded' by the co-ordinators of the group. The 'degraded' label, in this context, can be understood as a social construct, developed from the interaction between the human and non-human elements within the participant actor worlds (captured in Figure 8.1 by the double-heading arrows moving between the 'human' and 'non-human' worlds). An example of a feed-back arising from this study, meanwhile, was the recognition expressed to me by some informants that their participation in the group had increased their appreciation of the waterway's fishery values, some of them having previously considered it a non-descript fishery (Interviews, June – November 2001).

Exploring the notion of processes, activities, outputs and outcomes, it can be discerned that the planting of shrubs along the drain's bank was a process, their subsequent growth an output and their (potential) contribution to drain habitat, an outcome. From a political perspective, the increased recognition of the trout values of the drain that the initiative highlighted to waterway managers was a further outcome (Interviews, June – November 2001). From this description of an ecological model of CEM, below I explore a set of applied issues this research raises for the practice of CEM.

8.3 Questions and Tools for Community Environmental Management

The theoretical propositions and the model presented in the previous section raise a distinct set of challenges for students and practitioners of CEM as they contemplate ways of improving its effectiveness and efficiency. Advancement here demands that attention be directed at the way we frame CEM, the questions we ask of it and the development of appropriate practical initiatives within and around the approach. The consideration of these matters forms the focus of the second half of this discussion chapter.

8.3.1 Approaches to, and questions of, community environmental management

The 'ecological' model described in Section 8.2 establishes the primacy of the human actor, the interactive role of the human and non-human worlds and the part that

contextual variables play in the processes and outcomes of CEM. With these attributes in mind, it appears necessary, if society is to improve its understanding of CEM, which consideration is given to how scholars and practitioners approach it and the nature of the questions that they ask of it. Advancements in these areas can subsequently provide the basis for evaluative criteria that can be used to assist in the assessment of individual initiatives and programmes.

Approaching the question of how CEM should be conceptualised, the first concern involves the previously cited need to consider initiatives and programmes from the perspective of process rather than as 'things'. The second is to adopt the vantage point of the human actor as the social unit from which questions of it are asked. Observations from this study suggest that the notion of 'actor' does not have to strictly apply to individuals *per se*, but this term can embrace a collection of individuals who share some common viewpoints towards the environment, with anglers and farmers being examples from this research. Thirdly, instead of accepting organisations and the activities linked to these on their face value, emphasis needs to be given to how these can be underpinned by the claims of different actors towards the environment. Action in this sense, for example, subsequently becomes understood as meaningful, rather than something that is predetermined by structural elements.

Methodologically, this overall approach to CEM comprehension is essentially a humanist (or interpretative) outlook wherein the understanding of the human actor, as social agent, are of humans who engage in meaningful action. However, the acknowledgement of the role that social structures can play in peoples' environmental interpretations and actions suggest that adherence to a strict notion of voluntarism in accounting for human behaviour is inappropriate. Instead, attention must be given also to the influence of social structures and normative variables that shape human conduct (see Chapters Five and Six). Given this proviso, from the observations in this research, interpretation and action are best understood as the outputs emerging from the reconciliation of *agency* and *structural* matters (from the perspective of Figure 8.1, this can be understood as entailing interactions *within* the box labelled 'human world').

In addition to what this research suggests about the way CEM can be approached, it also raises the idea of a set of questions that scholars and practitioners should consider raising as they seek to understand the form, function and effectiveness of particular arrangements. These questions can be thought of as exploratory devices for delving beneath the veneer of CEM, with the emphasis on the exploratory questions of 'how' and 'what' rather than the empirical queries of 'why' and 'where'. In list form and in the order they should be asked, the questions are:

1. How can we differentiate and define the different actor groups present within and around a CEM arrangement?
2. How do these actors define their situation vis-à-vis the physical environment, each other and a CEM institution itself?
3. What goals do these different actors seek to accomplish (overtly and covertly) through involvement with CEM and how do these differ from those of other actors?
4. How do these goals and actor actions evolve from out of the worlds they inhabit (attention here should turn to the processes summarised in the ecology model – Figure 8.1)?
5. What is the *capacity* of the human and non-human world to accommodate these goals? Or what changes are necessary to make this so?
6. What strategies do actors use to promote their goals and how do these change through time?
7. How effective and efficient are the relative actor groups in respect to accomplishing these goals?
8. How do the resultant processes, activities, outputs and outcomes of CEM compare to the normative expectations of different groups (e.g., regional environmental managers)?

It is relevant to note meanwhile, in contemplating methods for eliciting the information to answer these questions, since the mid-1990s a range of tools have been developed that

are especially suited to this task. These include the use of community maps, focus groups and observation techniques (see Brosius et al., 1998; Carr and Halvorsen, 2001; EPA, 2003).

Association with the issue of how CEM is framed and the questions that need to be asked of it are a series of further considerations. The first is the need to consider the actor role of the researcher / evaluator. This includes the capacity of these actors to shape the responses they receive to the questions they ask. This can occur, for example, by way of the terms they use and the case studies they select. It is also prudent to acknowledge that research itself has meanings attached to it and can become an artefact drawn on by others to defend or refute certain claims on the physical and human world (see Callon, 1986). There is no clear method for ensuring the neutral use of the output from research, although care with conclusions and the insertion of appropriate qualifiers can limit the capacity for research being misappropriated.

A second consideration is the way that the notion of 'community' itself is defined. This is especially pertinent given the emphasis in this discussion to the importance of the human actor as a social entity. Hence the primary concern here is whether to view the 'community' as a *social unit* engaged in environmental management or as a *social level* at which this engagement occurs? Reflecting on the themes of the actor-oriented approach it is the latter distinction that is comparatively consistent with the other themes developed here. Support for this argument comes, for example, from the recognition that by understanding the roles of community in CEM as a *social level*, the primacy of the human-actor is not submerged beneath the homogenous tendencies that attach themselves to the *social unit* representation (see Agrawal and Gibson, 2001). Because of this, the *level* image of community can accommodate the inter-actor differences observed in this investigation more effectively than the traditional *unit* form. From these theoretical aspects, attention turns in the next sub-section to applied methods for assisting in the development of CEM in New Zealand.

8.3.2 Applied developments for community environmental management

Moving CEM forward from its present position necessitates the consideration of practical initiatives that can enhance its efficiency and effectiveness. As a discussion point, three matters emerge from this study that could be beneficial in this regard. These are: (a) integrative strategies; (b) monitoring and evaluation; and (c) the aligning of expectations with capacity. Each of these factors is discussed in detail below.

a. Integrative strategies and community environmental management

The notion of integration has evolved in environmental management as an instrument for addressing the problems of interpretative difference and the issues emerging from the physical, social and institutional dimensions of scale (see Chapter Six and Seven respectively). Despite the impressions from this study that integrating these respective elements would encourage efficiency and effectiveness in CEM, the efforts given over to strategies grounded around this has been minimal to non-existence in the context of the groups from this study. Nor does a wider review of CEM suggest it is common place elsewhere in New Zealand.

Exploring the notions of integration more closely, the first aspect listed above entails contemplating how the economic, social and political factors that shape people's interpretations and actions are accommodated into environmental decision-making (I describe this as micro-integration). A case-in-point of elements involved in this notion of integration are the influences that variables such as social norms, trust relations and social structures play on shaping people's responses to the physical world (see Chapters Five and Six). A framework integrating these factors consequently needs to acknowledge how both the *physical* and *social* elements of the environment shape human well-being, and their responses to natural phenomena and each other (i.e., the human and non-human parts of the ecological model summarised in Figure 8.1). One overseas attempt to reconcile these variables has been Preister and Kent's (1997) notion of *bio-social ecosystems*. Ideas from this model and my own observations, suggest that for any such integration strategy to work it must consider methods for harmonising the human / non-human elements that attribute to people's interpretations of the physical

world. Methodological approaches that have evolved to assist in this task include the use of: (a) environmental value typologies; (b) bio-social mapping; (c) social impact assessment; and (d) deliberative planning (see EPA, 2003; Hayward, 2000; Preister and Kent, 1997). The present use of these methods in New Zealand was not discerned in the course of this investigation.

A practical application of this integrative model, in circumstances from this research, would be the establishment of a riparian management strategy that seeks to recognise and accommodate for the normative, structural and qualities of human agency that shape people's interpretations of these physical environments. At present, in the situation involving the Barry's Stream Care group, for example, the role of local social norms has not been accommodated in the descriptions of Environment Canterbury staff describing their relations with this group. In contrast to this situation, a strategy along the lines raised above would seek to identify ways of harmonising these elements within the agency's interactions with this group.

The second notion of integration (termed here macro-integration) focuses on methods for reconciling management objectives across temporal and spatial zones. Like the preceding micro notion, this one also has physical, social, economic and political dimensions. However, whereas the former considers how these variables shape people's interpretations, in the latter expression the emphasis is on how these processes impact on the physical environment itself (i.e., the influence social change has *on* a landscape, rather than on different actors' *interpretations* of this landscape). The notion of macro-integration has been embraced within some descriptions of ecosystem-based management, wherein the focus has been on synthesising the various dimensions described above into sustainability strategies (Meffe et al., 2002). Similarly, the notion of integrated catchment management that has emerged from Australia and North America, also replicates these themes in their models for sustainable management (see Mitchell, 1997).

From a CEM perspective, it is evident that the nesting of CEM arrangements into an integrative policy environment, modelled on the themes and strategies above, could benefit CEM by creating a policy environment that complements the work of CEM groups. One self-evident reason for this is that no one group from this research would have the resources, energy, authority or inclination to handle *all* of the possible dimensions that impinge on the environments they are seeking to manage. Moreover, because the tendency has been for CEM groups in this study to focus on the physical dimensions of environmental management, the management of social and economic variables has received little overt attention (see Section 8.2)⁹². The difficulties encountered through this situation were demonstrated in the case of Waimara Estuary Care and its efforts to manage the physical condition of its local estuary. In this group's case, it is apparent that human physical practices and the social dimensions that attach to these have severely reduced the ecological accomplishments of the group (e.g., farming activities in the upper Waimara catchment). The implications of this for the activities of the organisation were described to me by an outside NGO representative, who stated:

They [the Waimara group] plant and do all those things around the edge, but in the end of the day what they do is not going to make a difference, too much, to the environmental health of the estuary . . . unless they go up the catchment (Informant, NGO, March 2003).

Nevertheless, despite the discernible benefits in addressing such matters through a macro-integration approach and the mounting popularity of it as a management instrument (e.g., Basher, 2003), the presence of these strategies on a regional and national scale is poorly represented in New Zealand⁹³. Because of this, as both the Parliamentary Commissioner for the Environment (2002) and Casswell (2001) have respectively emphasised, the achievements derived through local-leveled initiatives

⁹² An appropriate qualification is to note that groups, such as the Waimara example have acted in ways that reflect an acknowledgement of the role that social and economic aspects play in local relations (e.g., social norms). However, they have taken limited steps in terms of seeking to manage the elements that underpin these.

⁹³ The Motueka integrated catchment management strategy, being undertaken in the Nelson region, is a noteworthy exception here of a local attempt at macro-integration (see Basher, 2003).

remains restricted in New Zealand. Alternatively, efforts that seek to redress this situation can be anticipated to enhance the performance of CEM groups⁹⁴.

b. Monitoring and evaluation

The paucity of monitoring and evaluation amongst CEM initiatives operating in New Zealand was, as noted previously (see Section 8.2), a distinguishing feature of the groups in this study⁹⁵. While I have already described the reasons contributing to this situation, it is apparent that the absence of both complicates the ability to assess and develop ways to improve CEM performance. Further, given the aforementioned tendency for CEM to develop in an incremental fashion, it appears that such activities would be even more important in assisting institutions adjust through time. Contrastingly, at present the lack of monitoring data makes it difficult to evaluate the performance of groups against their objectives. While it is beyond the brief of this study to consider the full dimensions of a viable monitoring and evaluation strategy for CEM, some points from this investigation can be forwarded to those contemplating the development of such strategies⁹⁶.

The first consideration is the necessity of appreciating the relative and political qualities of any monitoring and evaluation enterprise. As Conley and Moote (2003) argue, no monitoring or evaluative strategy is politically neutral. Because of this it is necessary to appreciate that both can act as vehicles through which the public image of CEM is negotiated, legitimised and challenged. Accommodation of these traits requires practitioners to be attentive to the values, meanings that underpin the conclusions drawn from monitoring, and evaluation exercises. In essence, therefore, there is a need to monitor and evaluate the monitors and the evaluators. One means of accomplishing this is for practitioners to be attentive to the different values that underpin the criteria brought to the analysis of CEM processes and outcomes. Alternatively, getting actor

⁹⁴ As noted earlier in Chapter Seven, the linkages between the Animal Health Board's strategies and the broad objectives (i.e., bTB control) of the Maine Valley Local Initiative group are an example that demonstrates the benefits attained through a macro-integration approach.

⁹⁵ Again, the Maine Valley group is an exception here

⁹⁶ For further reference see Conley and Moote (2003), Innes (1999) and Lambie (1997).

support of the criteria used in CEM analysis could also provide a means of reducing conflict stemming from the interpretations promoted by a monitoring or evaluative programme.

It is also apparent from this study and the work of others (e.g., Hughey et al., 2002) that a lack of base-line environmental data in New Zealand complicates efforts to assess the performance of individual initiatives. Due to the complexities and expense of data collection this issue is not one that can be readily redressed through local level measures, instead it would be best contemplated as part of a macro-level environmental strategy. Further, it is also apparent that in situations where base-line data from which comparisons could be made do exist, such as in the Waimara and Barry's Stream contexts, the difficulty for groups is their inability to collect and analyse samples for comparative purposes. Actors from the Waitutu, Barry's Stream and Waimara groups, for instance, were observed to lack the resources, time, and inclination to measure faecal coliforms; a water quality measure for which an historical record existed into their respective cases. Other data-related issues that also need to be considered include the importance of focusing on indicators that relate to a project's objectives and the necessity of focusing on outcomes rather than outputs. Accommodating both of these would represent useful steps towards the avoidance of the 'goal trap' problem referred to in Chapter Three (see Deutscher, 1977).

Because neither monitoring nor evaluation are popular as group activities amongst New Zealand CEM arrangements (see Section 8.2), it appears that the promotion of these operational variables will require either strategies that change this behaviour, or alternatively arrangements that can manage for the deficit it creates. In the case of this research, for example, Environment Canterbury, with its skill and resource base has been a key supplier of water quality monitoring data to the Barry's Stream and Waitutu groups. Environment Southland and the Animal Health Board have provided similar support to the Waimara and Maine Valley initiatives, respectively. It therefore appears that integrating agency monitoring with the information needs of groups is a path that, from a monitoring perspective at least, can manage for some of the shortfalls

described above. Further, given the value of the work that CEM groups do at minimal cost to authorities, the provision of this service does not seem an unreasonable expectation of the state.

c. Aligning expectations with capacity

Three factors emerge from this study that can assist in overcoming the previously described tension between the expectation and capacities of CEM groups (see Section 8.2). These are: (a) recognition of the non-normative qualities of people's expectations; (b) refinement in the supplementation of goods and services to groups; and (c) aligning CEM with regional and national environmental imperatives.

Firstly, it is essential to accept that the notion of expectation, that is what actors hope to achieve through participation in a CEM group, is non-normative. This is because expectations, as this study illustrates, vary across actor groups. Furthermore, the capacity also exists for expectations that are on the one hand overt (e.g., expectations of physical change) and covert (e.g., expectations of political gain). Because of these twin capacities, it is essential that agreed definitions of group goals and objectives are reached as a foundation for reconciling the expectations of various actors associated with CEM initiatives. Correspondingly, any expectation needs to be evaluated against the micro- and macro-integrative issues described in 8.3.2 (a). For example, expectations that do not align with member norms (a micro issue) or conflict with physical and social activities elsewhere in the catchment (macro issue), will invariably be difficult or impossible to accomplish.

Secondly, a practitioner-oriented factor that emerges from this study that could significantly assist groups in aligning their capacities with their expectations involves a refinement in the nature of the goods and services available to them. On this point, one contribution I discerned as making a significant contribution to the capacity of groups to fulfil their physical objectives was the supply of skilled contract labour. In the case of the Waimara Estuary Care group, for example, a contract employee not only made significant advances in the development of the group's wetland project (see Plate 4.12),

but had also contributed to the preparation of a proposed management plan for this area. In assessing the value of this contribution, three factors emerge as significant. The first was the skills, experience and resources that this person was able to bring to the project. These skills were not, in contrast to group members, something that had to be acquired while working in the CEM group. Secondly, for this employee the project was his work, a factor that contrasted with group members who had to situate their involvement in the estuary care group around, not only their careers but also various demands on their non-work time. The subsequent capacity of this person to focus on and follow through with projects (as opposed to the stop-start pattern of member participation) was detected to have permitted significant headway to be made on developing its reserve.

There was, however, a notable latent problem arising from the use of this individual. At the root of this lies the legal culpability of CEM groups when they become 'employers'. This includes, in the New Zealand situation, health and safety and work standard issues. What I detected, in an interview with the contract employee working for the Waimara group, was that these issues were not being addressed. Any future efforts to promote the access of groups to contract labour will need to include clarification on these points. This appears especially important given the legal repercussions for, in this case the Waimara group, had some misadventure befallen its employee.

I am equally conscious that in the current climate of budget constraint that this practitioner-centred suggestion is likely to be dismissed on at least two grounds. The most obvious is cost while claims may also be made, secondly, that the use of contract labour is not philosophically consistent with the CEM 'ethic'. Observations from this research suggest that both claims are refutable. From the cost perspective, for example, I identified that when and where contracted labour was used it improved the effectiveness of the resources that groups had already been supplied with. This suggests, that from a net perspective, the overall contribution from such labour can legitimatise the expense. Claims that the input of contract labour is contrary to the philosophy of CEM, meanwhile, are easily dispelled by reference back to command and control tendencies in

CEM identified in Section 8.2. From this discussion, the prevalence of command and control aspects within CEM and the provision of contract labour would appear to be entirely consistent.

It is also necessary, as the work by Daniels (1992) and Beilin (1997) indicates, to consider the role that regional and national perspectives and strategies play in local environmental management changes. CEM does not operate in isolation from these processes, landscapes are re-commodified based on imperatives moderated over by the state, while productive activities are propelled by state agendas (regional and national). In New Zealand the continuation of the aforementioned environmental management approach and the limitations for environmental change that adhere to them will obstruct the contribution CEM can make to controlling the effects of human impacts on the human and non-human world. Without change here, the normative promise of CEM will go unrealised due to this wider systemic issue.

8.4 Summary

This discussion has focused on broadening the understanding of CEM, based on insights from the results portion of this study. Part of this task has included identifying the form, function and contribution of CEM, as well as setting out a model that can be used to assist in the exploration of initiatives elsewhere within New Zealand. This model is also anticipated to have practical worth beyond this country. Further, it has moved on to identify a set of developments that can assist in improving the contribution CEM can make to environmental management in New Zealand. In the ninth and final chapter, I revisit the various points raised in this study by way of a conclusion reflecting on the role and future of CEM in New Zealand.

Chapter Nine: Conclusion

*We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time*
T.S. Eliot (cited Rabinowitz, 2001, p. 259)

9.1 Reflections

This project arose from a concern. Through the 1990s, CEM-style arrangements have been revived as a means for addressing an array of biophysical issues in New Zealand and overseas. This development has, at the popular level, been premised on claims that CEM represents an efficient and effective alternative for addressing these concerns compared to other approaches (e.g., regulatory regimes). The subsequent assumption, that CEM represents a viable instrument for managing environmental issues, has gone largely unchallenged in New Zealand. This has persisted despite an increasing number of overseas reports and domestic observations, which have called into question the efficacy of this approach (e.g., Salmon, 1999; Songorwa, 2000). Because of this, the willingness of New Zealand environmental administrators to put their faith in CEM was something I found disconcerting in my former role as an environmental manager. It was concern arising from this situation that sparked this investigation and ultimately brings me to this conclusion chapter.

Back to the beginning, at the initial stages of this project my goal was straightforward (at least to me): I wanted to know 'does CEM work'? To investigate this, I composed three research objectives that focused on exploring the form, function, contribution and performance of the approach through six exploratory case studies. As the study proceeded, however, I became progressively aware that this goal was more complex than anticipated. For example, the emergence of attribution problems and the contested notion of what passes as environmental change demonstrated that things were more technically complicated and ontologically

diverse than expected. In the subsequent analytical journey through my case studies (using qualitative methods as my vehicle), I came to identify how matters such as trust, norms and nature interpretation impact on the process and outcomes of CEM and affect its contribution to sustainability. With these and the other findings of this study in mind, it appears that I have reached a destination of sorts, albeit one where the understanding acquired is not that anticipated at the journey's commencement.

Fundamental to arriving at this destination has been the use of the three analytical lenses used as the theoretical base for this research. These lenses, in the form of social capital, the social construction of nature and sustainability have not previously been used simultaneously, in New Zealand or elsewhere, to critically explore the topic of CEM. Further, as this study has demonstrated, while they appear likely to highlight different aspects about the approach, when bridging concepts such as social meaning are used, they are revealed to have analytical links.

At the end-point of this thesis however, two qualifications need to be reiterated on the insights yielded through the application of these lenses. The first is that neither separately nor together could they be argued to provide a definitive report on the form, function and contribution of CEM in New Zealand. What they do, instead, is highlight different qualities of the approach based around the theoretical light they shed. Nevertheless, by bringing three separate view-points to bear on CEM, and with the opportunity taken in this study to merge analysis across them, findings emerge that considerably advance the understanding of CEM from the prevailing metaphoric representations that describe it. Secondly, it is apparent from the discussion in Chapter Eight that the overall product that emerges from the use of these lenses *is not* a blueprint of CEM. Rather the outcome is one where when the 'stone of CEM' is lifted and we look at what is going on underneath it, a model is available that assists in making sense of what is observed.

What follows in the rest of this chapter are concluding points about how the findings of this study connect to its goal and objectives and the wider study of CEM. It also offers a consideration of future areas for research and notes some points

arising from the methodological approach I have used. It is completed by a set of concluding remarks.

9.2 The Re-representation of Community Environmental Management

The view of CEM observed at this thesis's end prompts a review of how it is represented at theoretical, applied and research levels. In contemplating these representations, I have also acquired insight into how this project delivers on its objectives.

Examining the question of theory firstly, this project was premised on the argument that existing narrative expressions of CEM within New Zealand represent a loosely woven combination of theoretical ideas and the contribution of domestic and international experience. Underscoring this, it was suggested, has been a set of normative assumptions that have included the belief that communities have the form and inclination to address environmental issues themselves (see Chapter Two). I have argued that these expressions are simplistic and idealistic in what they emphasise, and disguise the dynamic and intricate relationships that exist between people and their relationships with and within the biophysical world.

In particular, by exploring CEM through multiple theoretical lenses, we come to see how the physical spaces it occurs in – whether estuary, valley or stream catchment – are repositories of physical and social forces that influence its form, function and contribution to the human and physical worlds. This is demonstrated in this study, for example, in the way that different social relationships, multiple notions of nature and certain sustainability dilemmas imbue spaces such as those of Barry's Stream and Maine Valley. This representation of CEM, as a diverse and unstable institutional arrangement contrasts, for example, with the technical and economic visions of the *common property institute* narrative and the non-political image of participation that attaches to this and other expressions of CEM.

This study does more than challenge the way CEM is theoretically represented however; it also yields a model – centred on the human actor – for its

exploration. In this model, humans are not treated as neutral entities that merely have to be educated and supplied with goods and services to ensure their effective participation in CEM. Rather, people are identified as actors who engage in meaningful and strategic action that can be understood through the exploration of the ways that the human and non-human worlds reconcile with each other within different contexts (see Figure 8.1). As a perspective of CEM, this understanding goes beyond the narrow confines of the narratives from Chapter Two and prompts us to consider the contributions that culture, context and politics play in the processes and outcomes of it. Further, it provides a means for understanding the dynamic and intricate interplay between people and the biophysical worlds they occupy and interact with.

From a practical perspective, while this study raises questions about the contributions community-based initiatives make to environmental management it does not show that they are a fruitless exercise. In five of the cases explored, for example, some form of biophysical change consistent with the normative goals of the organisations investigated was observed to occur or could be anticipated. Further, this project also uncovers a number of variables that can assist groups in accomplishing their biophysical goals. These include, for example, consistency between a programme's biophysical objectives and the tendencies within the human-non-human system it is situated within. Nevertheless, it is apparent from the findings of this study and the work of others (e.g., Curtis, 2000) that, given the scale of existing ecological problems and the constraints facing community groups, a reality check is necessary about what they can accomplish. In short, it is unreasonable to expect that small-budgeted, voluntary programmes can address complex environmental issues across broad environmental scales. Because of this, the challenge of improving the effectiveness of CEM extends beyond changes to the approach itself to affect the wider biophysical and institutional environment that it is located within. This includes, as recognised in this study, national programmes that define and advance country-wide environmental goals and objectives. This appears to be an imperative if we are to develop integrated strategies that promote consistent ends across the local, regional and national levels of environmental governance.

To further the contribution of CEM, we must also refine how we set about to study it. This research highlights, for example, the understanding acquired through the exploration of the intricacies of collective action. In this instance, by being receptive to the polyvalent processes that affect human life, I have been rewarded with an in-depth understanding of a number of the processes underscoring human interpretation and action within CEM. The methodology of this project also highlights the opportunities that multiple case study research and theoretical pluralism yield as research tools. For example, the case studies used in this investigation have provided the opportunity to 'dig deep' into discrete and defined events and situations. This has subsequently provided the opportunity for examining the *practices* and *processes* of CEM within a set of six distinct contexts. The promotion of theoretical pluralism, meanwhile, has been achieved through the employment of multiple-lenses. Together, the merging of these techniques has yielded a powerful tool for guiding the exploration and analysis of CEM, while assisting me to avoid the problem of being 'blinkered' by adherence to a single theoretical lens. Further, the willingness to 'snowball' and build analysis *across* theoretical lenses has permitted me to develop meta-understandings that bridge across my theoretical fields. The consequences of this are, this study reveals, a more intricate and sophisticated understanding of CEM.

Turning to an overall consideration of this study's objectives, one leaves this project with an appreciation that the form, function and contribution of CEM in New Zealand has deeper roots than inferred through present descriptions. One aspect of this is the appreciation that to understand CEM scholars and practitioners must question how people define their situations, how these definitions affect their environmental management goals and how these goals change across time, space and actors. Through the need to address these questions, society becomes aware that CEM initiatives are, in part, a product of the very environments they seek to manage.

Placing this research in the context of other studies, from the perspective of environmental management generally, this research falls into a group of recent projects that have sought to explore what processes and strategies lie beneath the different tools used to govern the biophysical environment (e.g., Peet and Watts,

1996). Of particular relevance here are recent accounts (i.e., post-1997) that have focused on the roles that multiple meanings and power play on human collective action and where these, in turn, come from (e.g., Pfeffer et al., 2001). As approaches for improving understanding, these studies are not content to test the performance of environmental programmes against pre-described theoretical criteria as, for example, proponents of the *common property institution* narrative have tended to (e.g., Mäkelä, 1999). Rather, their interest has been on exploring inside these programmes to describe how attributes of human and non-human life affect what is treated as real within the realms of environmental administration⁹⁷. In relation to CEM itself, this project contributes a New Zealand-based account to a mounting array of research questioning the normative assumptions of this policy approach (e.g., Curtis, 1995; Lockie and Vanclay, 1997). Thus, while the focus in this account is on developments within New Zealand, and the theoretical lenses used do not necessarily concur with those used elsewhere, I believe it makes a net contribution to this growing international field of critical CEM understanding.

9.3 Methodological Conclusions

Some consideration in this conclusion needs to be given to the values and limits of this study, derived from the choice of methodological foundations. The choice of qualitative / interpretative research instruments and case studies as the unit of analysis may be suggested to yield findings that are so relative as to have no general meaning. I maintain that it would be short-sighted to discount what this research tells us on the basis of this argument.

In contrast to arguments lamenting the relativity of this investigation, underscoring the findings of this project is an expectation that even a limited number of phenomena can reveal matters that are of general importance and can therefore contribute to the development of theory and general understanding, even if only on a partial basis (see Clayton, 1998). In particular, when it is accepted that people across six distinct cases of CEM share certain traits, then tentative hypotheses can be made about their actions and the outcomes they conspire to produce. Knowledge and

⁹⁷ Efforts at this have subsequently extended from the consideration of colonial and post-colonial national park administration in Africa (Neumann, 1998) to river restoration in Finland (Kortelainen, 1999).

understanding of the source and role of social natures and strong / weak tie networks are examples of emergent theorisations from this study. Further, the use of comparative approaches, namely analytical induction in this account, has contributed additionally to the robustness of these theoretical propositions.

Not withstanding these points, some qualifications need to be made about the scope of this study. This investigation represents a snapshot rather than a comprehensive portrait of CEM in New Zealand. There are, for instance, no examples of co-management arrangements between the state and local Maori in this account⁹⁸ nor is there a case study involving state sponsored collaborative arrangements (which seek to incorporate a range of stakeholders). Rather than illustrating shortcomings in my case study selection process however, these omissions demonstrate what I consider the diversity of CEM arrangements in New Zealand⁹⁹. Nevertheless, I retain a degree of confidence, from my work in this study and experience as an environmental manager, that a number of the processes described in this project are replicated across CEM arrangements not explored here (e.g., the conflict derived through the existence of different social natures). It is also valid to acknowledge that a research account can only go so far in what it incorporates. Provided with these qualifications, it is appropriate to consider here where this study suggests future research to be needed.

9.4 Future Research

As an over-arching focus for future research, insights from this project suggest that an imperative should be the development of a cascading set of environmental management goals and objectives for New Zealand (i.e., goals and objectives that have a local through to national dimension to them). In lieu of this, the present-day management framework means that the nation's overall environmental management focus remains centred on the consequences rather than causes of environmental change. Because of this, any attempts at local-level management (e.g., CEM-based) tend to remain isolated from other efforts. This is

⁹⁸ Explanation as to why this is was provided in Chapter Three.

⁹⁹ The use of survey techniques could have measured for this diversity, but then such a study would not have obtained the in-depth observations that were accomplished in this account.

because the management of effects is oriented towards specific problems (e.g., overcoming water pollution issues in a single waterway). Further, as goals and objectives go undefined, the opportunity for the debate that their public consideration would engender is lost. This hampers, in turn, the opportunity for exploring means of reconciling the socio-economic, political and biophysical worlds that shape New Zealand's environmental destiny. The results of the present situation, consequently, are a focus on biophysical effects at the expense of working backwards to their roots in human activities and practices. It needs to be emphasised here however, that while the development of a cascade system of environmental goals and objectives appears to have self-evident worth, the move from research to their implementation would require political will; such resolve, at this time, appears to be lacking at the central level of state governance in New Zealand (see PCE, 2002).

Linked to the above concern is the need for research into indicators, which can assist society to gauge the effectiveness of institutional arrangements in delivering on any regime of goals and objectives. As environmental tools, the further advancements in the development of an indicator programme would provide a means for closing the gap between theory, practice and outcomes within the realms of environmental management in New Zealand¹⁰⁰. Two points emerge from this research as crucial to the efficacy of a research approach dedicated to this task.

Firstly, this research needs to yield indicators that are relevant from the local to national level of society, and which link directly to the goal / objective regime recommended above. Secondly, it is necessary, as observations in this study demonstrate, that indicators are developed that allow society to understand the processes that link human activity to environmental change (the same argument can be claimed for the development of environmental goals and objectives as well) (see Crabtree and Bayfield, 1998). Without such knowledge, situations may arise where well intentioned indicators actually undermine what managers seek to accomplish. A case-in-point would be using levels of riparian vegetation as indicators of aquatic health. In regard to this variable, work in New Zealand and overseas has shown that

¹⁰⁰ It is necessary to note that the argument for indicators has also come from previous studies of CEM in New Zealand, most notably Hughey et al. (2002).

the causative relationship between these variables is mixed (see Howard-Williams and Pickmere, 1994). One also needs to consider ways for preventing the hijacking of indicator programmes from the political / ideological intentions of different sector groups (again, the same claim can be extended to the matter of environmental goals and objectives).

Linking goals, objectives and indicators requires further research into methods for connecting the micro and macro levels of human life. A case-in-point would be a strategy that fuses local, regional and national efforts to improve water quality (macro-level integration) with local micro-level processes (e.g., aspects of social structure and human agency) that affect peoples' relationships with each other and the physical world. Since the mid-1990s, the rise of concepts such as adaptive and ecosystem management have offered pathways for accomplishing the goal of macro-level integration. However, the development of connections between this scale and the micro-world has not been forthcoming. The resulting effect has been that the likes of adaptive management have become complicit in perpetuating the image of a physical environment that is separate from the social, a process that this study shows to be fallacious. Research that explores means for promoting harmony between the macro and micro worlds of integration would offer the means, in contrast, of embedding macro-integrative initiatives into local social contexts.

Without further research, CEM runs the risk of being shaped through ideological arguments and simplistic assumptions. The future, therefore, offers opportunities and challenges for the development of CEM as a policy tool. As the above points intimate, a great deal of scope remains for critical thinking. Further, to dismiss this as 'too hard' or to substitute it for simplistic models and assumptions will not advance matters. Instead, it will see practitioners become party to a policy approach that obscures and disguises.

9.5 Concluding Remarks

Contemporary expressions of CEM in New Zealand are still in their infancy and the only thing assured is change. Any assessments of effectiveness therefore remain tentative and preliminary at this time. In this context, simplistic, metaphoric notions

of CEM have a persuasive quality and utility value in explaining and selling the approach to a wide policy audience. Such constructs, however, serve as poor foundations for the development and refinement of policy, an argument that underpins this thesis as a whole.

This project, in turn, constitutes an effort to move CEM from abstract understandings to something that is more concrete. By concentrating on questions about the form, function, and contribution of individual community-based initiatives, it reveals that 'turning things over to the community' will not ensure the automatic accomplishment of normative environmental outcomes. Instead, a range of constraints and opportunities exist that can simultaneously conspire against or assist in the achievement of desired normative ends. Without identifying and understanding these, even the best intended programme may fall short of society's expectations.

My closing message is about awareness, openness and the importance of context: awareness of the multiple meanings that people bring to and that permeate through the CEM process, openness to the effects that these meanings can have on human collective action, and the capacity of these respective qualities to change through space and time. Each of these variables emerges from this account as qualities that influence the shape, processes and outcomes of individual instances of CEM. Considered together they highlight the need for analysts and practitioners to be critical of the popular pronouncements that attach to the concept. In this situation, the current emphasis on 'civility' and 'common ground' as foundations for resolving environmental issues are not excuses for ignoring the roles that contested social meanings and politics play in CEM. Further, failure to link CEM practice with people's perceived livelihood needs can only make those who advance the approach complicit in what Li (2001) describes as a 'political economy of ignorance'.

At the journey's end, it is apparent that in making CEM work there are no magic blue-prints or quick fixes. There are, however, things society needs to be aware of and processes that can be engaged in to discover the form and extent of different variables that affect it. This includes, from this study, tools that draw out the meanings people bring to CEM initiatives and the aspects of human agency and

social structure that contribute to these. In this regard, openness to the role that human and non-human interactions play in shaping CEM arrangements appear to be pre-requisites for efforts intended to improve its efficiency and effectiveness.

References

Abercrombie, N., Hill, S. and Turner, B. (1994). *The penguin dictionary of sociology*. London: Penguin.

Ackroyd, P. (1991). *Community-based institutions for sustainable management: A review and a critique*. Lincoln: Centre for Resource Management. X

Adams, W. (1990). *Green development. Environment and sustainability in the third world*. London: Routledge.

Agarwal, B. (2001). Participatory exclusions, community forestry and gender: An analysis of south Asia and a conceptual framework. *World Development*, 29(10), 1623-1648.

Agrawal, A. (2001). Common property institutions and sustainable governance of resources. *World Development*, 29(10), 1649-1672.

Agrawal, A. and Gibson, C. (1999). Community and conservation: Beyond enchantment and disenchantment. *World Development*, 27(4), 629-649. X

Agrawal, A. and Gibson, C. (2001). Introduction. The role of community in natural resource conservation. In A. Agrawal and C. Gibson (Eds.) *Communities and the environment. Ethnicity, gender, and the state in community-based conservation* (pp. 1-31). New Brunswick: Rutgers University Press. X

Allen, W., Bosch, O., Kilvington, M., Oliver, J. and Gilbert, M. (2001). Benefits of collaborative learning for environmental management: Applying the integrated systems for knowledge management approach to support animal pest control. *Environmental Management*, 27(2), 215-223. (7)

Allison, G. (1971). *The essence of decision. Explaining the Cuban missile crisis*. Boston: Little, Brown and Company.

Animal Health Board. (Undated). *Let's stop bovine TB!* (pamphlet). Wellington: Animal Health Board.

Animal Health Board. (1995). *Proposed national pest management strategy for bovine tuberculosis*. Wellington: Animal Health Board.

Animal Health Board. (2001). *Tb monitoring and control*. Wellington: Animal Health Board. Retrieved May 21, 2001 from <http://www.ahb.org.nz/tb/vector.html>

Asher, W. (1995). *Communities and sustainable forestry in developing countries*. San Francisco: ICS Press.

Atkinson, P. (1990). *The ethnographic imagination: Textual constructions of reality*. London: Routledge.

Auty, R. and Brown, K. (Eds.) (1997). *Approaches to sustainable development*. London: Pinter.

Australian and New Zealand Environment Council. (2002). *Australia water quality guidelines for freshwater and marine water*. Melbourne: Australia and New Zealand.

Babbie, E. (1998). *The practice of social research* (9th edition). Belmont: Wadsworth.

Bailey, M. (1997). Landcare: Myth or reality? In S. Lockie and F. Vanclay (Eds.) *Critical Landcare* (pp. 129-142). Wagga Wagga: Centre for Rural Studies.

Baland, J. and Platteau, J. (1996). *Halting degradation of natural resources: Is there a role for rural communities?* Oxford: Clarendon Press.

Bardwell, L. (1991). Problem-framing: A perspective on environmental problem-solving. *Environment Management*, 15(5), 603-612.

Basher, L.R. (2003). *The Motueka and Riwaka catchments: A technical report summarising the present state of knowledge of the catchments, management issues and research needs for integrated catchment management*. Lincoln: Manaaki Whenua-Landcare Research.

Beale, J. (1980). *The manager and the environment. General theory and practice of environmental management*. Oxford: Pergamon Press.

Becker, H. (1998). *Tricks of the trade. How to think about your research while you're doing it*. Chicago: Chicago of University Press.

Beilin, R. (1997). The construction of women in Landcare: Does it make a difference? In S. Lockie and F. Vanclay (Eds.) *Critical Landcare* (pp. 57-70). Wagga Wagga: Centre for Rural Studies.

Berger, L. and Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. New York: Anchor Books.

Berkes, F. (Ed.) (1989). *Common property resources: Ecology and community-based sustainable development*. London: Belhaven Press.

Berkes, F., George, P. and Preston, R. (1991). Co-management: The evolution in theory and practice of the joint administration of living resources. *Alternatives*, 18(2), 13-17.

Bernard, T. and Young, J. (1997). *The ecology of hope. Communities collaborate for sustainability*. Montpellier: New Society Publishers.

Bissonette, J. (Ed.) (1997). *Wildlife and landscape ecology: Effects of pattern and scale*. New York: Springer-Verlag.

Bjornn, T. and Reiser, D. (1991). Habitat requirements of salmonids in streams. In W. Meehan (Ed.) *Influences of forest and rangeland management on salmonid fishes and their habitats* (pp. 83-138). Bethesda: American Fisheries Society.

Blomquist, W. (1992). *Dividing the waters: Governing groundwater in southern California*. San Francisco: ICS Press.

Blumer, H. (1969). *Symbolic interactionism: Perspective and method*. Englewood Cliffs: Prentice-Hall.

Bogdan, R. and Biklen, S. (1982). *Qualitative research for education: An introduction to theory and methods*. Boston: Allyn and Bacon.

Bookchin, M. (1990). *The philosophy of social ecology: Essays on dialectical naturalism*. Montreal: Black Ross Books.

Boston, J., Martin, J., Pallot, J. and Walsh, P. (1996). *Public management. The New Zealand model*. Auckland: Oxford University Press. X

Bourdieu, P. (1985). The forms of capital. In J.G. Richardson (Ed.) *Handbook of theory and research for the sociology of education* (pp. 241-258). New York: Greenwood.

Brasell-Jones, T. (1998). *The experience of women in co-management landcare groups: Issues of representation, participation and decision making*. Wellington: Ministry of Agriculture and Forestry. X

Braun, B. and Wainwright, J. (2001). Nature, post-structuralism, and politics. In N. Castree and B. Braun (Eds.) *Social nature. Theory, practice, and politics* (pp. 41-63). Oxford: Blackwell Publishers.

Bridger, J. and Luloff, A. (2001). Building the sustainable community: Is social capital the answer? *Sociological Inquiry*, 17(4), 458-472.

Bristow, R. (1997). Hurunui district plan conflicts with property rights - farmers. *The Press*, Friday September 26th, p. 14.

Bristow, R. (2000). Farmers liken mayor to Mugabe. *The Press*, Thursday August 10th, p. 7.

Bromley, D. (1992). The commons, property and common property regimes. In D. Bromley (Ed.) *Making the commons work: Theory, practice and policy* (pp. 3-15). San Francisco: Institute for Contemporary Studies Press.

Brosius, J., Tsing, A. and Zerner, C. (1998). Representing communities: Histories and politics of community-based natural resource management. *Society and Natural Resources*, 11(2), 157-168.

Buenavista, G. (1998). *Social capital in community-based resource management*. Manila: SANREM CRSP. Retrieved May 15, 1999 from <http://www.Crc.gso.uri.edu/comm/htmpubs/ic/IC28buenavista.html>

Bührs, T. (2000). The environment and the role of the state in New Zealand. In P.A. Memon and H. Perkins (Eds.) *Environmental planning and management in New Zealand* (pp. 27-35). Palmerston North: Dunmore Press Ltd.

Burgess, J., Clark, J. and Harrison, C. (2000). Knowledges in action: An actor-network analysis of a wetland agri-environment scheme. *Ecological Economics*, 35(1), 119-132.

Burr, V. (1995). *An introduction to social constructivism*. London: Routledge.

Buttel, F. and Taylor, P. (1994). Environmental sociology and global environmental change. In M. Redclift and T. Benton (Eds.) *Social theory and the global environment* (pp. 228-255). London: Routledge.

Callon, M. (1986). Some elements in a sociology of translation: Domestication of the scallops and fishermen of St. Briec Bay. In J. Law (Ed.) *Power, action, belief* (pp. 19-34). London: Routledge.

Cannan, C. (2000). The environmental crisis, greens and community development. *Community Development Journal*, 33(4), 365-376.

Carr, D. and Halvorsen, K. (2001). An evaluation of three democratic community-based approaches to citizen participation: Surveys, conversations with community groups and community dinners. *Society and Natural Resources*, 14(2), 107-126.

Casswell, S. (2001). Community capacity building a social policy – what can be achieved? *Social Policy Journal of New Zealand*, 17, 22-35.

Castree, N. (1997). Nature, economy and the cultural politics of theory: The 'war against the seals' in the Bering Sea, 1870-1911. *Geoforum*, 28(1), 1-20.

Castree, N. and Braun, B. (1998). The construction of nature and the nature of construction. Analytical and political tools for building survivable futures. In N. Castree and B. Braun (Eds.) *Remaking reality: Nature at the Millennium* (pp. 3-42). London: Routledge.

Castree, N. and MacMillan, T. (2001). Dissolving dualisms: Actor-networks and the re-imagination of nature. In N. Castree and B. Braun (Eds.) *Social nature. Theory, practice, and politics* (pp. 208-224). Oxford: Blackwell Publishers.

Christchurch City Council and Lucas and Associates. (1998). *Restoring Avoca Stream. A community model*. Christchurch: Christchurch City Council and Lucas and Associates.

Christchurch City Council. (1999). Southshore under scrutiny. *Christchurch City Scene*, November-December, p.1.

Clayton, P. (1998). *Connections on the ice. Environmental ethics in theory and practice*. Philadelphia: Temple University Press.

Clifford-Walton, V., Liepins, R., Romans, S. and Herbison, P. (1998). Adapting to change: Women, work and the farm. *New Zealand Sociology*, 12(2), 129-158.

Cloke, P. and Goodwin, M. (1992). Conceptualising countryside change: From post-Fordism to rural structural coherence. *Transactions of the Institute of British Geographers*, 17, 321-336.

Cocklin, C., Blunden, G. and Davis, P. (2000). Sustainable resource management: Views from Northland's paddocks. In P.A. Memon and H. Perkins (Eds.) *Environment planning and management in New Zealand* (pp. 168-176). Palmerston North: Dunmore Press Ltd.

Coggins, G. (1998). Regulating federal natural resources: A summary case against devolved collaboration. *Ecological Law Quarterly*, 25(4), 602-610.

Cohen, J. (1985). Strategy or identity: New theoretical paradigms and contemporary social movements. *Social Research*, 52, 663-716.

Coleman, J. (1986). Social theory, social research, and a theory of action. *American Journal of Sociology*, 91(6), 1309-1335.

Coleman, J. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, (Supplement) S95-120.

Coleman, J. (1990). *The foundation of social theory*. Cambridge: Harvard University Press.

Common, M. (1995). *Sustainability and policy – limits to economics*. Cambridge: Cambridge University Press.

Community and Voluntary Sector Working Party. (2001). *Communities and government: Potential for partnership = whakatapu whakaaro: Report of the Community and Voluntary Sector Working Party*. Wellington: Ministry of Social Policy.

Conley, A. and Moote, M. (2003). Evaluating collaborative natural resource management. *Society and Natural Resources*, 16(5), 371-386.

Coughlin, C., Hoben, M., Manskopf, D. and Quesada, S. (1999). *A systemic assessment of collaborative resource management partnerships*. Master of Science thesis, University of Michigan, Ann Arbor.

Cowie, B., Lineham, I. and Lovis, P. (1986). *Waimakariri river and catchment. Resource survey*. (Volume II). Christchurch: North Canterbury Catchment Board and Regional Water Board.

Crabtree, B. and Bayfield, N. (1998). Developing sustainability indicators for mountain ecosystems: A study of the Cairngorms, Scotland. *Journal of Environmental Management*, 52, 1-14.

Cramb, R., Garcia, J., Gerrits, R. and Saguiguit, G. (2000). Conservation farming projects in the Philippine uplands: Rhetoric and reality. *World Development*, 28(5), 911-927.

Cronon, W. (1995). The trouble with wilderness; or getting back to the wrong nature. In W. Cronon (Ed.) *Uncommon ground: Toward reinventing nature* (pp. 69-90). New York: W.W. Norton.

Curtis, A. (1995). *Landcare in Australia: A critical review*. Albury: Johnstone Centre of Parks, Recreation and Heritage.

Curtis, A. (2000). Landcare: Approaching the limits of voluntary action. *Australian Journal of Environmental Management*, 7(1), 19-28.

Dahl, R. and Tufts, E. (1973). *Size and democracy*. Stanford: Stanford University Press.

Dahles, H. (1993). Game killing and killing games: An anthropologist looking at hunting in a modern society. *Society and Animals*, 1(2), 3-16.

Daly, H. and Cobb, J. (1990). *For the common good*. Boston: Beacon Press.

Daniels, P.L. (1992). Barriers to sustainable development in natural resource-based economies: Australia as a case study. *Society and Natural Resources*, 5(3), 247-262.

Davenport, D. (1997). A review from the ground: Farmers, sustainability and change. In S. Lockie and F. Vanclay (Eds.) *Critical Landcare* (pp. 153-163). Wagga Wagga: Centre for Rural Studies.

Demeritt, D. (1996). Social theory and the reconstruction of science and geography. *Transactions of the Institute of British Geographers*, 21, 484-503.

Demeritt, D. (2002). What is the 'social construction of nature'? A typology and sympathetic critique. *Progress in Human Geography*, 26(6), 767-790.

Denzin, N. and Lincoln, Y. (1994). IV. Methods of collecting and analysing empirical materials. In N. Denzin and Y. Lincoln (Eds.) *Handbook of qualitative research* (pp. 353-360). Thousand Oaks: Sage.

Department of Conservation and Ministry for the Environment. (1998). *New Zealand's biodiversity strategy. Our chance to turn the tide*. Wellington: Department of Conservation and Ministry for the Environment. ✓

Deutscher, I. (1977). Towards avoiding the goal trap in evaluation research. In F. Caro (Ed.) *Readings in evaluation research* (pp. 221-238). New York: Russell Sage Foundation.

Dewitt, J. (1994). *Civic environmentalism. Alternatives to regulation in states and communities*. Washington, D.C.: Congressional Quarterly Inc. ✓

Diesendorf, M. and Hamilton, C. (Eds.) (1997). *Human ecology, human economy. Ideas for an ecologically sustainable future*. St Leonards: Allen and Unwin.

Dixon, J. and Fallon, L. (1989). The concept of sustainability: Origins, extensions and usefulness for policy. *Society and Natural Resources*, 2(2), 73-84.

Dodds, S. (1997). Economic growth and human well-being. In M. Diesendorf and C. Hamilton (Eds.) *Human ecology, human economy. Ideas for an ecological sustainable future* (pp. 48-124). St. Leonards: Allen and Unwin.

Domeck, M., Williams, J., and Wood, C. (1997). Watershed restoration: Social and scientific challenges for fish biologists. *Journal of American Fisheries Society*, 25(5), 26-27.

Drinkwater, M. (1992). Visible actors and visible researchers: Critical hermeneutics in an actor-oriented perspective. *Sociologia Ruralis*, 32(4), 367-388.

Dryzek, J. (1990). Designs for environmental discourse: The greening of the administrative state? In R. Paehlke and D. Torgerson (Eds.) *Managing leviathan: Environmental politics and the administrative state* (pp. 97-111). Peterborough: Broadview Press.

Dryzek, J. (1992). Ecology and discursive democracy: Beyond liberal capitalism and the administrative state. *Capitalism, Nature, Socialism*, 3(1), 18-42.

Dubois, O., Dalal-Clayton, B. and Dent, D. (2003). *Rural planning in developing countries. Supporting natural resource management and sustainable livelihoods*. London: Earthscan.

Durkheim, E. (1897 [1951]). *Suicide: A study in sociology* (translated by J.A. Spaulding and G. Simpson). New York: Free Press.

Easton, B. (1997). *The commercialisation of New Zealand*. Auckland: Auckland University Press.

Easton, B. (1999). *The whimpering of the state: Policy after MMP*. Auckland: Auckland University Press.

Eden, S., Tunstall, S. and Tapsell, S. (2000). Translating nature: River restoration as nature-culture. *Environment and Planning D: Society and Space*, 18(2), 257-273.

Egan, A., Jones, S., Luloff, A. and Finley, J. (1995). The value of using multiple methods: An illustration using survey, focus groups and delphi techniques. *Society and Natural Resources*, 8(5), 457-465.

Egoz, S., Bowring, J. and Perkins, H. (2001). Tastes in tension: Form, function, and meaning in New Zealand's farmed landscapes. *Landscape and Urban Planning*, 57, 177-196.

Emerson, R., Fretz, R. and Shaw, L. (1995). *Writing ethnographic fieldnotes*. Chicago: University of Chicago Press.

Environment Canterbury. (Undated_a). *Riparian zones. A guide to the protection of Canterbury's rivers, streams and wetlands*. Christchurch: Environment Canterbury.

Environment Canterbury. (Undated_b). *Environment enhancement fund*. Christchurch: Environment Canterbury.

Environment Canterbury. (2000). Care groups in action. *Living Here*, December, p. 5.

Environment Canterbury. (2001_a). Resource care. Canterbury. *Newsletter for resource care groups in the Canterbury region*. Christchurch: Environment Canterbury.

Environment Canterbury. (2001_b). *Discussion draft. Canterbury natural resources regional plan. Chapter 9: Wetlands*. Christchurch: Environment Canterbury.

Environment Canterbury. (2002). Pat on the back - A day in the life of a resource care co-ordinator, *Living Here*, October, p.2.

Environment Canterbury. (2003). *Resource care groups in Canterbury*. Christchurch: Environment Canterbury.

Environment Protection Agency. (1997). *People, places and partnerships: A progress report on community-based environmental protection*. Washington D.C.: Environment Protection Agency.

Environment Protection Agency. (2002). *Community culture and the environment. A guide to understanding a sense of place*. Washington D.C.: Environment Protection Agency.

Environment Southland. (2000). *Water. State of the environment report, October 2000*. Invercargill: Environment Southland.

Environment Southland. (2001). *Implementation strategy and operational plan. Community partnership in sustainable land management*. Invercargill: Environment Southland.

Environment Southland. (2003). *Water quality data. Waimara Estuary and tributaries* (unpublished). Invercargill: Environment Southland.

Escobar, A. (1998). Whose knowledge, whose nature? Biodiversity conservation and the political ecology of social movements. *Journal of Political Ecology*, 5(1), 53-82.

Etzioni, A. (1993). *The spirit of community: Rights, responsibilities and the communitarian agenda*. New York: Crown.

Ewing, S. (1997). 'Small is beautiful': The place of the case study in Landcare evaluation. In S. Lockie and F. Vanclay (Eds.) *Critical Landcare* (pp. 175-183). Wagga Wagga: Centre for Rural Social Research.

Falconer, K. (2000). Farm-level constraints on agri-environmental scheme participation: A transactional perspective. *Journal of Rural Studies*, 16(3), 379-394.

Fine, G. (1998). *Morel tales. The culture of mushrooming*. Cambridge: Harvard University Press.

Fine, G.A. (2001). Enacting norms: Mushrooming and the culture of expectations and explanations. In M. Hechter and K. Opp (Eds.) *Social norms* (pp. 139-164). New York: Russell Sage Foundation.

Fitzgerald, G. (1999). *Community involvement in conservation management issues: A New Zealand action research project*. Wellington: Department of Conservation.

Fitzpatrick, M. and Else, D. (1999). *Tanzania, Zanzibar and Pemba*. Hawthorn: Lonely Planet Publications.

Flannery, T. (1994). *The future eaters*. Melbourne: Reed Books.

Flyvbjerg, B. (2001). *Making social science matter. Why social inquiry fails and how it can succeed again*. Cambridge: Cambridge University Press.

Folke, C., Berkes, F. and Colding, J. (1998). Ecological practices and social mechanisms for building resilience and sustainability. In F. Berkes and C. Folke (Eds.) *Linking social and ecological systems* (pp. 414-436). London: Cambridge University Press.

Fox, J. (1992). The problem of scale in community resource management. *Environmental Management*, 16(3), 289-297.

Franklin, A. (1998). Naturalising sports. Hunting and angling in modern environments. *International Review for the Sociology of Sport*, 33(4), 355-366.

Franklin, A. (2002). *Nature and social theory*. London: Sage Publications.

Fukuyama, F. (1995). *Trust: The social virtues and the creation of prosperity*. New York: The Free Press.

Furusest, O. and Cocklin, C. (1995). An institutional framework for sustainable resource management: A New Zealand model. *Natural Resources Journal*, 35(2), 243-273.

Gadgil, M. and Berkes, F. (1991). Traditional resource management systems. *Resource Management and Optimisation*, 8, 127-141.

Garfinkel, H. (1963). A comparison of and experiments with 'trust' as a condition of stable concerted actions. In O.J. Harvey (Ed.) *Motivation and social interaction* (pp. 187-238). New York: Ronald Press.

Garfinkel, H. (1967). *Studies in ethnomethodology*. Englewood Cliffs: Prentice Hall.

Geertz, C. (1973). *The interpretation of cultures: Selected essays*. New York: Basic Books.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. Cambridge: Polity Press.

Glasby, G. (2000). Prospects for the sustainable management of New Zealand's bio-physical environment. In P.A. Memon and H. Perkins (Eds.) *Environment planning and management in New Zealand* (pp. 143-155). Palmerston North: Dunmore Press Ltd.

Glaser, B. (1978). *Theoretical sensitivity*. Mill Valley: Sociological Press.

Glaser, B. and Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.

- Gorringe, T. (1999). *Fair shares: Ethics and the global economy*. London: Thames and Hudson.
- Gottret, M. and White, D. (2001). Assessing the impact of integrated natural resource management: Challenges and experiences. *Conservation Ecology*, 5(2). Retrieved December 10, 2002 from <http://www.consecol.org/vol5/iss2/art17>
- Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360-1380.
- Gray, A. (2000). Adaptive ecosystem management in the Pacific northwest: A case study from coastal Oregon. *Conservation Ecology*, 4(2). Retrieved December 10, 2002 from <http://www.consecol.org/vol4/iss2/art6>
- Greenberg, J. and Park, T. (1994). Political ecology. *Political Ecology*, 1(1), 1-12.
- Greider, T. and Garkovitch, L. (1994). Landscapes: The social construction of nature and the environment. *Rural Sociology*, 59(1), 1-24.
- Grundy, K. (1993). *Sustainable development: A New Zealand perspective*. Dunedin: University of Otago Press.
- Gunderson, L. and Holling, S. (Eds.) (2002). *Panarchy. Understanding transformations in human and natural systems*. Washington D.C.: Island Press.
- Habermas, J. (1981). New social movements. *Telos*, 49, 33-37.
- Hall-Jones, F. (1945). *Historical Southland*. Invercargill: H and J Smith Ltd.
- Hamilton, C. (1997). Foundations of ecological economics. In M. Diesendorf and C. Hamilton (Eds.) *Human ecology, human economy. Ideas for an ecologically sustainable future* (pp. 35-63). St Leonards: Allen and Unwin.
- Hannigan, J. (1995). *Environmental sociology. A social constructionist perspective*. London: Routledge.
- Haraway, D.J. (1991). *Simians, cyborgs, and women: The reinvention of nature*. New York: Routledge.
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162, 1241-1252.
- Haworth, R. (1997). Fine sentiments vs. brute actions. The Landcare ethic and land clearing. In S. Lockie and F. Vanclay (Eds.) *Critical Landcare* (pp. 165-174). Wagga Wagga: Centre for Rural Studies.

Hayward, B. (1995). The greening of participatory democracy. *Environmental Politics*, 4(4), 217-236.

Hayward, B. (2000). *Beyond consensus. Social learning in urban planning*. Ph.D. thesis, Otago University, Dunedin.

Heiman, M. (1997). Community attempts at sustainable development through corporate accountability. *Journal of Environmental Planning and Management*, 40, 631-643.

Helford, R. (2000). Constructing nature as constructing science: Expertise, activist science, and public conflict in the Chicago wilderness. In P. Gobster and B. Hull (Eds.) *Restoring nature. Perspectives from the social sciences and humanities* (pp. 119-142). Washington D.C.: Island Press.

Herbert-Cheshire, L. (2000). Contemporary strategies for rural community development in Australia: A governmentality perspective. *Journal of Rural Studies*, 16(2), 203-215.

Heritage, J. (1984). *Garfinkel and ethnomethodology*. Cambridge: Polity Press.

Heritage, J. (1998). Harold Garfinkel. In R. Stones (Ed.) *Key sociological thinkers* (pp. 175-188). Houndmills: Palgrave.

Hicks, B. and Reeves, G. (1994). Restoration of stream habitat for fish using in-stream structures. In K.J. Collier (Ed.) *Restoration of aquatic habitats* (pp. 67-91). Selected papers from the second day of the New Zealand Limnological Society 1993 annual conference. X

Hilhorst, D. (2003). *The real world of NGOs*. London: Zed Books.

Hobbs, M. (2001). *Priorities for the environment portfolio: Objectives*. Wellington: Office of the Minister for the Environment. Retrieved 12 May, 2001 from <http://www.executive.govt.nz/minister/hobbes/environment/objectives.html>

Holling, C. (1995). What barriers? What bridges? In L. Gunderson, C. Holling and S. Light (Eds.) *Barriers and bridges to the renewal of ecosystems and institutions* (pp. 3-34). New York: Columbia University Press

Horlick-Jones, T. (1998). Meaning and contextualisation in risk assessment. *Reliability Engineering and Systems Safety*, 59, 79-89.

Howard-Williams, C. and Pickmere, S. (1994). Long-term vegetation and water quality changes associated with the restoration of a pasture stream. In K.J. Collier (Ed.) *Restoration of aquatic habitats* (pp. 93-109). Selected papers from the second day of the New Zealand Limnological Society 1993 annual conference. O

Hughes, J. (1990). *The philosophy of social research* (second edition). London: Longman.

Hughey, F., Cullen, R. and Kerr, G. (2000). Stakeholder groups in fisheries management. *Marine Policy*, 24(2), 119-127. X

Hughey, K.F.D., Keller, M., Kilvington, M., Smith, T., and Wilkinson, R. (2002). *Environmental aims and outcomes from a study of six community-based environmental management groups in New Zealand*. Lincoln, Lincoln University and Manaaki Whenua-Landcare Research. X

Hughey, K.F.D. (2001). Biggest drought comes in ideas for water planning, *The Press*, Friday April 27th, p. 5.

Hull, B., Robertson, D. and Kendra, A. (2001). Public understanding of nature: A case study of local knowledge about 'natural' forest condition. *Society and Natural Resources*, 14(4), 325-340.

Hulme, D. and Murphree, M. (2001). *African wildlife and livelihoods. The promise and performance of community conservation*. Oxford: Heinemann.

Ife, J. (1995). *Community development*. Melbourne: Longman.

Innes, J. (1999). Evaluating consensus building. In L. Susskind, S. McKearnan and J. Thomas-Lamer (Eds.) *The consensus building handbook: A comprehensive guide to reaching agreement* (pp. 441 – 456). Thousand Oaks: Sage.

Irwin, A. (2001). *Sociology and the environment*. Cambridge: Polity Press.

Jacobs, M. (1991). *The green economy. Environment, sustainable development and the politics of the future*. London: Pluto Press.

Jasanoff, S. (1990). *The fifth branch: Science advisors as policy makers*. Cambridge: Harvard University Press.

Jellyman, D. (1987). *Personal photography*. Christchurch: Donald Jellyman.

Jones, S. (1999). From meta-narratives to flexible frameworks: An actor level analysis of land degradation in highland Tanzania. *Global Environmental Change*, 9, 211-219.

Kellert, S., Mehta, J., Ebbin, S. and Lichtenfeld, L. (2000). Community natural resource management: Promise, rhetoric and reality. *Society and Natural Resources*, 13(8), 705-715. X

Kemmis, D. (1990). *Community and the politics of place*. Norman and London: University of Oklahoma Press.

Keene, H. (2003). Dairy farm in balance. *The Press*, Monday April 4th, p. B8.

Kerr, R. (2000). Downsizing the state. *The Press*, 3rd January, p. 5.

Kilvington, M. (1998). *The Whaingaroa catchment management project: A multi-stakeholder approach to sustainable catchment management*. Lincoln: Manaaki Whenua-Landcare Research.

Kincheloe, J. and McLean, P. (1994). Rethinking critical theory and qualitative research. In N. Denzin and Y. Lincoln (Eds.) *Handbook of qualitative research* (pp. 138-157). Thousand Oaks: Sage.

Kortelainen, J. (1999). The river as an actor-network: The Finnish forest industry utilisation of lake and river systems. *Geoforum*, 30, 235-247.

Kraft, M., and Johnson, B. (1999). Clean water and the promise of collaborative decision making: The case of the Fox Wolf basin in Wisconsin. In D. Mazmanian and M. Kraft (Eds.) *Towards sustainable communities. Transition and transformations in environmental policy* (pp. 113-151). Cambridge: MIT Press.

Kroll-Smith, J. Grunter, V. and Spring, S. (2000). Theoretical stances and environmental debates: Reconciling the physical and the symbolic. *The American Sociologist*, 100(1), 44-61.

Lambie, J. (1997). *Community-based environment monitoring: Conditions essential for long term provision of quality data*. Master of Applied Science thesis, Lincoln University: Lincoln.

Langlands, P. (2001). The death of Canterbury's lowland streams - A personal perspective. *New Zealand Fishing News*, June, p. 18H-18I.

Lash, S. and Urry, J. (1987). *The end of organised capitalism*. Cambridge: Polity Press.

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Cambridge: Harvard University Press.

Latour, B. (1991). Technology is society made durable. In J. Law (Ed.) *A sociology of monsters* (pp. 101-131). London: Routledge and Kegan Paul.

Latour, B. (1993). *We have never been modern*. Hemel Hempstead: Harvester Wheatsheaf.

Le Heron, R. and Pawson, E. (1996). *Changing places: New Zealand in the nineties*. Auckland: Longman Paul.

Leach, M. (1991). Engendered environments: Understanding natural resource management in the West African forest zone. *IDS Bulletin*, 22(4), 17-24.

Leach, M., Mearns, R., and Scoones, I. (1997a). Community-based sustainable development: Consensus or conflict? *IDS Bulletin*, 28, 1-3.

Leach, M., Mearns, R. and Scoones, I (1997b). Challenges to community-based sustainable development: Dynamics, entitlements, institutions. *IDS Bulletin*, 28, 4-14.

Leach, W. and Pelkey, N. (2001). Making watershed partnerships work: A review of the empirical literature. *Journal of Water Resources Planning and Management*, 127, 378-385.

Leach, W., Pelkey, N. and Sabatier, P. (2002). Stakeholder partnerships as collaborative policy making: Evaluation criteria applied to watershed management in California and Washington. *Journal of Policy Analysis and Management*, 21(4). Retrieved August 26, 2002 from <http://www3.interscience.wiley.com/cgi-bin/jtoc?ID=34787>

Legat, N. (1998). Shore thing. Coast guardians. *North and South*, May, p. 92-97.

Lenihan, J. (2002). *Review of government funding for Landcare - a background paper*, Wellington: Ministry for the Environment.

Lewis, D. (1999). *International perspectives on voluntary action. Reshaping the third sector*. London: Earthscan.

Li, T. (1996). Images of community: Discourse and strategy in property relations. *Development and Change*, 27, 501-527.

Li, T. (2002). Engaging simplifications: Community-based resource management, market processes and state agendas in upland southeast Asia. *World Development*, 30(2), 265-283.

Lindblom, C. (1980). *The policy making process*. Englewood Cliffs: Prentice Hall.

Lobley, M. and Potter, C. (1998). Environmental stewardship in United Kingdom agriculture: A comparison of the Environmental Sensitive Area programme and the Countryside Stewardship Scheme in southeast England. *Geoforum*, 29, 413-432.

Lockie, S. (1997). What future Landcare? New directions under provisional funding. In S. Lockie and F. Vanclay (Eds.) *Critical Landcare* (pp. 227-238). Wagga Wagga: Centre for Rural Studies.

Lockie, S. (1999). Community movements and corporate images: 'Landcare in Australia'. *Rural Sociology*, 4(2), 219-233.

- Lofland, J. and Lofland, L. (1995). *Analysing social settings*. Belmont: Wadsworth.
- Long, N. (1989). Conclusion: Theoretical reflections on actor, structure and interface. In N. Long (Ed.) *Encounters at the interface. A perspective on social discontinuities in rural development* (pp. 221-244). Wageningen: Wageningen Agriculture University.
- Long, N. (2002). *Development sociology. Actor perspectives*. London: Routledge.
- Lotz, J. (1987). Community development: A short history. *Journal of Community Development*. May-June, 41-46.
- Lough, R. (1991). *Landcare in Australia*. Christchurch: R. Lough.
- Lovell, C., Mandondo, A. and Moriarty, P. (2002). The question of scale in integrated natural resource management. *Conservation Ecology*, 5(2). Retrieved December 10, 2002 from <http://www.consecol.org/vol5/iss2/art25>
- Macnaghten, P. and Urry, J. (1998). *Contested natures*. London: Sage Publications.
- Main, M. and Lavender, R. (2003). *Barry's Stream: Assessment of Water quality and invertebrate health monitoring. July 1994 to May 2002*. Christchurch: Environment Canterbury.
- Maine, D. (1983). In search of mesostructure. *Urban Life*, 11, 267-279.
- Mäkelä, M. (1999). *Community-based environmental protection and natural resources management*. Helsinki: Ministry for Foreign Affairs of Finland.
- Martin, P. (1997). The constitution of power in Landcare: A post-structuralist perspective with modernist undertones. In S. Lockie and F. Vanclay (Eds.) *Critical Landcare* (pp. 45-56). Wagga Wagga: Centre for Rural Studies.
- Martin, P. and Halpin, D. (1998). Landcare as a politically relevant new social movement? *Journal of Rural Studies*, 14(4), 445-457.
- Matunga, H. (2000). Decolonising planning: The Treaty of Waitangi, the environment and a dual planning tradition. In P.A. Memon and H. Perkins (Eds.) *Environment planning and management in New Zealand* (pp. 36-47). Palmerston North: Dunmore Press Ltd.
- McCallum, W.D. and Memon, P.A. (2002). Scared cows, holy waters and udder matters: Economic change, dairying and common pool resources in New Zealand. Paper Read at the IX Biennial Conference of the international association for the study of common property, June 17th-21st Victoria Falls: Zimbabwe.

McCay, B. (2001). Conclusion. Community and the commons: Romantic and other views. In A. Agrawal and C. Gibson (Eds.) *Communities and the environment. Ethnicity, gender and the state in community-based conservation* (pp. 180-191). New Brunswick: Rutgers University Press.

McCay, B. and Acheson, J. (Eds.) (1987). *The question of the commons: The culture and ecology of communal resources*. Tucson: University of Arizona Press.

McCloskey, M. (1998). Local communities and the management of public forests. *Ecological Law Quarterly*, 25(4), 624-629.

McDowall, R.M. (1994). *Gamekeepers for the nation. The story of New Zealand's acclimatisation societies 1861-1990*. Christchurch: Canterbury University Press.

McHenry, H. (1994). *Understanding the farmer's view: Perceptions of changing agriculture and the move to agri-environmental policies in southern Scotland*. Ph.D. thesis, University of Aberdeen, Aberdeen.

McHenry, H. (1998). Wild flowers in the wrong field are weeds! Examining farmers' constructions of conservation. *Environment and Planning A*, 30(6), 1039-1053.

Meffe, G., Nielsen, L., Knight, R. and Schenborn, D. (2002). *Ecosystem management. Adaptive, community-based conservation*. Washington D.C.: Island Press.

Mehta, J. and Kellert, S. (1998). Local attitudes towards community-based conservation policy and programmes in Nepal: A case study in the Makalu Barum Conservation Area. *Environmental Conservation*, 25(4), 320-333.

Memon, P.A. and Perkins, H. (Eds.) (2000). *Environmental planning and management in New Zealand*. Palmerston North: Dunmore Press Ltd.

Memon, P.A. (1993). *Keeping New Zealand green: Recent environmental reforms*. Dunedin: University of Otago Press.

Meredith, T. (1999). Concepts, cosmologies, and commitment: Using biodiversity indicators in critical zone models. In J.T. Pierce and A. Dale (Eds.) *Communities, development, and sustainability across Canada* (pp. 69-89). Vancouver: UBC Press.

Midgley, J. (1986). *Community participation, social development, and the state*. London: Methuen.

Mies, M. and Shiva, V. (1993). *Ecofeminism*. London: Zed Press.

Millar, F. (1975). *West to the fiords. The history of western Southland. Comprising Wallace and Fiord counties, the borough of Waimara and the various town districts within these areas*. Christchurch: Whitcombs Ltd.

Millar, R. (2000). *Sustainable management through social capital construction. The types of support and services Landcare groups require from regional councils: A case study in Southland and Canterbury*. Master of Science dissertation, Lincoln University, Lincoln.

Millar, V., Hallstein, M. and Quass, S. (1996). Feminist politics and environmental justice. Woman's community activism in west Harlem, New York. In D. Rocheleau, B. Thomas-Slayter and E. Wangari (Eds.) *Feminism political ecology. Global issues and local experiences* (pp. 62-85). London: Routledge.

Mills, G. (1994). Community development and fish farming in Malawi. *Community Development Journal*, 29(3), 215-221.

Ministry for the Environment. (1995). *Environment 2010 strategy. A statement of the Government's strategy on the environment*. Wellington: Ministry for the Environment.

Ministry for the Environment. (1996). *Sustainable land management: A strategy for New Zealand*. Wellington: Ministry for the Environment.

Ministry for the Environment. (1997). *The state of New Zealand's Environment 1997*. Wellington: Ministry for the Environment.

Ministry for the Environment. (2002). *Microbiological water quality guidelines for marine and freshwater recreational areas*. Wellington: Ministry for the Environment.

Mitchell, B. (1997). *Resource and environmental management*. Harlow: Longman.

Moeckli, J. and Braun, B. (2001). Gendered natures: Feminism, politics, and social nature. In N. Castree and B. Braun (Eds.) *Social nature. Theory, practice and politics* (pp. 112-132). Malden: Blackwells.

Moller, H., Horsley, P., Lyver, P., Taiepa, T., Davis, J. and Bragg, M. (2000). Co-management by Māori and Pākehā for improved conservation in the twenty-first century. In P.A. Memon and H. Perkins (Eds.) *Environmental planning and management in New Zealand* (pp. 156-167). Palmerston North: Dunmore Press Ltd.

Monkman, B., Main, M. and Lavender, R. (2003). *Draft Waitutu Creek, Waitutu Stream and Little Waitutu: Assessment of water quality and aquatic ecosystems 1999-2001*. Christchurch: Environment Canterbury.

Moore, C. (1998). Leithfield does things its way. *The Press*, Friday September 4th, p. 13.

Moser, C. (1993). *Gender planning and development: Theory, practice and training*. London: Routledge.

- Mosse, D. (1997). The symbolic making of a common property resource: History, ecology, and locality in a tank-irrigation landscape in south India. *Development and Change*, 28, 467-504.
- Mulgan, R. (1994). *Politics in New Zealand*. Auckland: Auckland University Press.
- Munasinghe, M. and McNeely, J. (1995). Key concepts and terminology of sustainable development. In M. Munasinghe and W. Shearer. (Eds.) *Defining and measuring sustainability. The biophysical foundations* (pp. 19-56). Washington D.C.: World Bank.
- Murdoch, J. (1987). Towards a geography of heterogeneous associations. *Progress in Human Geography*, 21(3), 321-337.
- Murdoch, J. (1997). Inhuman/non-human/human : actor-network theory and the prospects for a non-dualistic and symmetrical perspective on nature and society. *Society and Space*, 15, 731-756.
- Naiman, R.J. (Ed.) (1992). *Watershed management: Balancing sustainability and environmental change*. New York.
- Nechodom, M. (1998). *Democracy, ecology and the politics of place*. Ph.D. thesis, University of California, Santa Cruz.
- Nelson, J. (1995). Sustainable development, conservation strategies and heritage. In D. Mitchell (Ed.) *Resource and environmental management in Canada. Addressing conflict and uncertainty* (pp. 384-405). Toronto: Oxford University Press.
- Neumann, R. (1998). *Imposing wilderness. Struggles over livelihood and nature preservation in Africa*. Berkeley: University of California Press.
- North Canterbury Fish and Game Council. (2003). *Salmonid populations of Kemps Drain 1991-2002. A comparative study* (unpublished). Christchurch: North Canterbury Fish and Game Council.
- North, D. (1990). *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.
- Offe, C. (1985). New social movements: Challenging the boundaries of institutional politics. *Social Research*, 52(4), 817-868.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge: Cambridge University Press.
- Ostrom, E. (1998). A behavioral approach to the rational choice theory of collective action. Presidential address. American Political Science Association 1997. *American Political Science Review*, 92(1), 1-22.

Ostrom, E. (1999). Coping with tragedies of the commons. *Annual Review of Political Science*, 2, 493-535.

Paehlke, R. and Torgerson, D. (Eds.) (1990). *Managing leviathan: Environmental politics and the administrative state*. Peterborough: Broadview Press.

Paolisso, M. and Chambers, E. (2001). Culture, politics, and toxic dinoflagellate blooms: The anthropology of *Pfiesteria*. *Human Organisation*, 60(1), 1-12.

Park, G. (1995). *Ngā uruora. The groves of life. Ecology and history in a New Zealand landscape*. Wellington: Victoria University Press.

Park, G. (2002). 'Swamps which might doubtless easily be drained'. Swamp drainage and its impacts on the indigenous. In E. Pawson and T. Brooking (Eds.) *Environmental histories of New Zealand* (pp. 151-165). Melbourne: Oxford University Press.

Parkyn, S., Matheson, F., Cook, J. and Quinn, J. (2002). *Review of the environmental effects of agriculture on freshwaters*. Hamilton: National Institute of Water and Atmospheric Research Ltd.

Parliamentary Commissioner for the Environment. (2002). *Creating our future. Sustainable development for New Zealand*. Wellington: Parliamentary Commissioner for the Environment.

Patton, M. (1990). *Qualitative evaluation and research methods*. Newbury Park: Sage.

Paulson, D. (1998). Collaborative management of public rangeland in Wyoming: Lessons in co-management. *The Professional Geographer*, 50, 301-315.

Pawson, E. and Brooking, T. (Eds.) (2002). *Environmental histories of New Zealand*. Melbourne: Oxford University Press.

Peet, R. and Watts, M. (Eds.) *Liberation ecologies: Environment, development, social movements*. London: Routledge.

Perkins, H. (Forthcoming). Commodification: Re-resourcing rural areas. In P. Cloke, T. Marsden and P. Mooney (Eds.) *Handbook of rural studies*. London: Sage.

Pfeffer, M., Schelhas, J. and Day, L. (2001). Forest conservation, value conflict, and interest formation in a Honduran national park. *Rural Sociology*, 66(3), 382-402.

Pinkerton, E. (1994). Local fisheries co-management: A review of international experiences and their implications for salmon management in British Columbia. *Canadian Journal of Fisheries and Aquatic Sciences*, 19(1), 39-45.

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 22, 1-24.

Portes, A. and Landolt, P. (1996). The downside of social capital. *The American Prospect*, 26(May-June), 18-21.

Preister, K. and Kent, J. (1997). Social ecology: A new pathway to watershed restoration. In J. Williams, C. Wood and M. Dombeck (Eds.) *Watershed restoration: Principles and practices* (pp. 28-48). Bethesda: American Fisheries Society.

Pretty, J. and Ward, H. (2001). Social capital and the environment. *World Development*, 29(2), 209-227.

Pritchard, L. and Sanderson, S. (2002). The dynamics of political discourse in seeking sustainability. In L. Gunderson and S. Holling (Eds.) *Panarchy. Understanding transformations in human and natural systems* (pp. 147-169). Washington D.C.: Island Press.

Private Diary. (2002). *Hague Stream salmon spawning results*. Rakaia: Anonymous.

Proctor, J. (1998). The social construction of nature: Relativist accusations and critical realist responses. *Annals of the Association of American Geographers*, 88(3), 352-376.

Proctor, J. and Pincelt, S. (1996). Nature and the reproduction of endangered space: The spotted owl in the Pacific northwest and southern California. *Environment and Planning D: Society and Space*, 14(6), 683-708.

Prystupa, M. (1998). Barriers and strategies to the development of co-management regimes in New Zealand: The case of Te Waihora. *Human Organisation*, 57(2), 134-144.

Putnam, R. (1993). The prosperous community. *The American Prospect*, 13(spring), 35-42.

Putnam, R. (1995a). Bowling alone: America's declining social capital. *Journal of Democracy*, 6(1), 65-78.

Putnam, R. (1995b). Tuning in, tuning out: The strange disappearance of social capital in America. *PS: Political Science and Politics*, 28(4), 664-683.

Putnam, R., Leonardi, R. and Nanetti, R. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton: Princeton University Press.

Pye-Smith, C., Borrini-Feyerabend, G. and Sandbrook, R. (1994). *The wealth of communities*. London: Earthscan Publications.

- Ramsey, K. (2000). Community spirit. *The Press*, Saturday January 29th, p.23.
- Redclift, M. (1987). *Sustainable development. Exploring the contradictions*. London: Methuen.
- Reid, R. Letter to Canterbury Trout Unlimited Canterbury chapter, date 20th March 1992.
- Richardson, M. (1998). *Social capital. All that is good?* Master of Arts thesis, University of Canterbury, Christchurch.
- Ritchie, H. (1996). Voluntary and participative approaches to rural environmental management: The case of Landcare groups in Waikato. *Proceedings. Resource Management: Issues, visions, practice* (pp. 223-232), July 5th – 8th, Lincoln University: Lincoln.
- Ritchie, H. (1998). *Beyond the fences: Co-ordinating individual action in rural resource management through landcare. A case study of managing non-point source discharges to water in Waikato, New Zealand*. Ph.D. thesis, University of Western Sydney, Hawkesbury.
- Robinson, M. (1995). Towards a new paradigm of community development. *Community Development Journal*, 30(1), 21-30.
- Rosgen, D. and Fittante, B. (1986). Fish habitat structures. A selection guide using stream classification. In J. Millar, J. Arway and R. Carline (Eds.) *Proceedings. Fifth trout stream habitat improvement workshop* (pp. 163-179). Pennsylvania Fish Commission, Harrisburg, Pennsylvania.
- Rudd, M. (2000). Live long and prosper: Collective action, social capital and social vision. *Ecological Economics*, 34(1), 131-144.
- Russell, M. (1996). *Revolution. New Zealand from fortress to free market*. Auckland: Hodder Moa, Beckett.
- Sabatier, P. (1991). Towards better theories of the policy process. *Political Science and Politics*, 24(2), 147-156.
- Salamon, S., Farnsworth, R. and Rendziak, J. (1998). Is locally led conservation planning working? A farm town case study. *Rural Sociology*, 63(2), 214-234.
- Salmon, G. (1999a). How dairying destroyed the Waikakahi, *Maruia Pacific*, June, p. 15.
- Salmon, G. (1999b). Towards sustainable property rights. *Ecologic*, November, p. 14-15.

Scarce, R. (1999). Who – or what – is in control here? Understanding the social context of salmon biology. *Society and Natural Resources*, 12(8), 763-776.

Scarce, R. (2000). *Fishy business. Salmon, biology, and the social construction of nature*. Philadelphia: Temple University Press.

Scheffer, M., Westley, F., Brock, W. and Holmgren, M. (2002). Dynamic interaction of societies and ecosystems – linking theories from ecology, economy, and sociology. In L. Gunderson and C. Holling (Eds.) *Panarchy. Understanding transformations in human and natural systems* (pp. 195-239). Washington D.C.: Island Press.

Schuller, T., Baron, S. and Field, J. (2000). Social capital: A review and critique. In S. Baron, J. Field and T. Schuller (Eds.) *Social capital. Critical perspectives* (pp. 1-38). Oxford: Oxford University Press.

Scott, A. (1990). *Ideology and the new social movements*. London: Unwin and Hyman.

Scott, J. (1991). *Social network analysis: A handbook*. Thousand Oaks: Sage.

Sedgwick, C. (1983). *The helpless tail to the statistical kite: The life history: A method with issues, troubles and a future* (3rd edition). Christchurch: University of Canterbury.

Selman, P. and Wragg, A. (1999). Networks of co-operation and knowledge in 'wider countryside' planning. *Environmental Planning and Management A*, 42(5), 649-669.

Selsky, J. and Memon, P.A. (1997). Urban port development conflicts: Towards managing an amenity commons. *Urban Policy and Research*, 15(4), 259-268.

Smith, S. (1997). Deepening participatory action-research. In S. Smith and D. Willms (Eds.) *Nurtured by knowledge: Learning to do participatory action research* (pp. 173-263). New York: Apex Press.

Sneddon, C., Harris, L., Dimitrov, R. and Özesmi, U. (2002). Contested waters: Conflict, scale, and sustainability in aquatic socio-ecological systems. *Society and Natural Resources*, 15(8), 663-675.

Sobels, J., Curtis, A. and Lockie, S. (2001). The role of Landcare group networks in rural Australia: Exploring the contribution of social capital. *Journal of Rural Studies*, 17(3), 265-276.

Society for Applied Anthropology. (2001). *Community participation in watershed management*. Oklahoma City: Society for Applied Anthropology.

Songorwa, A. (2000). Community-based wildlife management (CWM) in Tanzania: Are the communities interested? *World Development*, 30(12), 2061-2079.

Soulé, M. and Lease, G. (Eds.) (1995). *Reinventing nature? Responses to postmodern deconstruction*. Washington D.C.: Island Press.

Stein, N. and Edwards, V. (1999). Collective action in common pool resource management: The contribution of a social constructivist perspective to existing theory. *Society and Natural Resources*, 12(6), 539-557.

Stokking, K. (Ed.) (1999). *Evaluating environmental education*. Gland: International Union for Conservation of Nature and Natural Resources.

Strauss, A. and Corbin, J. (1994). Grounded theory methodology. An overview. In N. Denzin and Y. Lincoln (Eds.) *Handbook of qualitative research* (pp. 273-285). Thousand Oaks: Sage Publications.

Swaffield, S. (1991). *Roles and meanings of 'landscapes'*. Ph.D. thesis, Lincoln University, Lincoln.

Tang, S. (1992). *Institutions and collective action: Self-governance in irrigation systems*. San Francisco: ICS Press.

Taylor, S. and Bogdan, R. (1998). *Introduction to qualitative research methods: A guidebook and resource* (3rd Edition). New York: Wiley.

Tester, F. (1992). Reflection on Tis Wis: Environmentalism and the evolution of citizen participation in Canada. *Alternatives*, 19(1), 34-41.

Tewari, D. and Isemonger, A. (1998). Joint forest management in south Gujarat, India: A case of successful community development. *Community Development Journal*, 33(1), 32-40.

Thompson, F. (1971). Suburban living and the concept of community. *Australian and New Zealand Journal of Sociology*, 7(2), 23-37.

Thorns, D. (1994). Racism and ethnicity. In P. Spoonley, D., Pearson and I. Shirley (Eds.) *New Zealand society. A sociological introduction* (2nd Edition) (pp. 81-97). Palmerston North: Dunmore Press.

Tolich, M. and Davidson, C. (1989). *Starting fieldwork. An introduction to qualitative research in New Zealand*. Oxford: Oxford University Press.

Torgerson, D. (1990). Limits of the administrative mind: The problem of defining environmental problems. In R. Paehlke and D. Torgerson (Eds.) *Managing leviathan. Environmental politics and the administrative state* (pp 115-161). Peterborough: Broadview Press.

Towle, S. (2002). New Zealand Landcare Trust. *New Zealand Environment*, Issue 10, Friday 7th June, p. 9.

Twyman, C. (2000). Participatory conservation? Community-based natural resource management in Botswana. *The Geographic Journal*, 166(4), 323-335.

University of Washington. (2001). *Rethinking nature and identity in a dematerialised world* (course syllabus). Seattle: University of Washington. Retrieved August 16, 2001 from <http://depts.washington.edu/its/nature.htm>

Unwin, M., Kinnison, M. and Quinn, T. (1999). Exceptions to semelparity: post-maturation survival, morphology, and energetics of male chinook salmon (*Oncorhynchus tshawytscha*). *Canadian Journal of Fisheries and Aquatic Sciences*, 56, 1172-1181.

Urry, J. (1995). A middle-class countryside. In T. Butler and M. Savage (Eds.) *Social change and the middle classes* (pp. 205-219). London: UCL Press.

Velody, I. and Williams, R. (1998). *The politics of constructionism*. London: Sage.

Vought, L., Pinay, G., Fuglsanig, A. and Ruffinoni, C. (1995). Structure and function of buffer strips from a water quality perspective in agricultural landscapes. *Landscape and Urban Planning*, 31, 323-331.

Wade, R. (1988). *Village republics: Economic conditions for collective action in south India*. Oakland: ICS Press.

Waimakariri District Council. (1998). *Proposed Waimakariri District Plan*. Rangiora: Waimakariri District Council.

Wainwright, C. and Wehrmeyer, W. (1998). Success in integrating conservation and development? A study from Zambia. *World Development*, 26(6), 933-944.

Warburton, D. (1998). A passionate dialogue: Community and sustainable development. In D. Warburton (Ed.) *Community and sustainable development* (pp. 1-39). London: Earthscan.

Warren, J. and Proctor, L. (2000). *Effectiveness of the New Zealand Landcare Trust*. Wellington: Centre for Research, Evaluation and Social Assessment.

Weick, K. (2001). *Making sense of the organisation*. Malden: Blackwells.

Western, D. and Wright, R. (1994). Background to community-based conservation. In D. Western and R. Wright (Eds.) *Natural connections: Perspectives in community-based conservation* (pp. 1-12). Washington, D.C.: Island Press.

White, A., Hale, L., Renard, Y. and Cortesi, L. (1994). *Collaborative and community-based management of coral reefs: Lessons from experience*. West Hartford: Kumarian Press Inc.

Williams, M., Ross, D., Mulcock, C., Elliot, R., Campbell, A., Ensor, A. and Hughes, H. (1995). *What has been achieved and learned in the five-year rabbit and land management programme* (set of overheads from a 'Rabbit and Land Management Programme' presentation at Parliament on Wednesday April 5th, 1995). Christchurch: M. Williams, D. Ross, C. Mulcock, R. Elliot, A. Campbell, A. Ensor, and H. Hughes.

Williams, R. (1985). *Keywords. A vocabulary of culture and society*. New York: Oxford University Press.

Wilson, H. (2002). *Hinewai. The journal of a New Zealand naturalist*. Christchurch: Shoal Bay Press.

Woolcock, M. (1998). Social capital and economic development: Towards a theoretical synthesis and policy framework. *Theory and Society*, 27, 151-208.

Woolgar, S. (1988). *Science – the very idea*. London: Tavistock.

World Bank. (1998). *The international workshop on community-based natural resource management*. Washington, D.C.: World Bank. Retrieved May 12, 2003 from <http://worldbank.org/wbi/conatrem/>

World Commission on Environmental and Development. (1987). *Our common future*. Oxford: Oxford University Press.

Yencken, D. and Wilkinson, D. (2000). *Resetting the compass: Australia's journey towards sustainability*. Collingwood: CSIRO Publishing.

Yin, R. (1988). *Case study research: Design and methods*. Newbury Park: Sage.

Zeller, M. (1997). *Common ground: Community-based conservation of natural resources*. Denver: Conservation Partners.

Appendix One

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