

**Environment, Society and Natural Resource
Management**

Environment, Society and Natural Resource Management

Theoretical Perspectives from Australasia and
the Americas

Edited by

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Acknowledgments

In July 1999 over 1500 delegates from throughout the world gathered in Brisbane, Australia, for the International Symposium on Society and Resource Management (ISSRM). This was the eighth such meeting held by the organisers of ISSRM. The broad theme of the conference was *The Application of Social Science to Resource Management in the Asia Pacific Region*. There was a great diversity in content with symposium themes including Indigenous Land and Resource Management, Community Participation in Resource Management, Human–Wildlife Interactions, Gender and Resource Management, Watershed Management and Soil Conservation, and Integrated Conservation in Developing Countries.

We thank the Symposium Co-chairs, Professors Geoff McDonald, Terry de Lacy, Roy Rickson and Donald Field for their kind offer to us to organise Session 1 of the conference – Theoretical Issues in Environment and Natural Resource Management. We also thank the more than 40 participants who provided papers in our session, and especially to those whose papers form the basis of this book. Sally Brown and Madeleine Boyd provided excellent ‘behind the scenes’ support in the organisation of Session 1. Associate Professor David Burch assisted us in making initial contact with the Edward Elgar publishing group, while Dymphna Evans and staff of Edward Elgar provided editorial guidance and assistance, and were enthusiastic supporters of the book. Dania Lawrence assisted us with referencing, Dimity Lawrence produced camera-ready copies of the entire manuscript and Janet Norton provided editorial support and compiled the index.

One of the ‘findings’ of the conference was that there is a paucity of material theorising the environment/society/natural resources nexus. We believe this book will not only help to foster conceptual clarity in this area, but will also suggest some new choices in the theoretical frameworks adopted by researchers in future field studies. We sincerely thank all those who have assisted us in our task of compiling what we hope will be a valuable collection of papers dealing explicitly with the ‘social’ in natural resource management.

Geoffrey Lawrence
Vaughan Higgins
Stewart Lockie

1. What's Social about Natural Resources and Why do we Need to Theorise it?

**Stewart Lockie, Vaughan Higgins and
Geoffrey Lawrence**

INTRODUCTION

For decades, social scientists have struggled for recognition as valid contributors to natural resource management (NRM). Overshadowed by the seemingly obvious importance of soils, hydrology, agronomy, biology, ecology and a host of other apparently 'natural' dimensions of NRM, the social dimensions of NRM have all too often been ignored. So, how much have things changed? Since the report of the World Commission on Environment and Development in 1987 (WCED, 1987) there has been growing international recognition of the relationships between what we understand as natural and social resources (or between environments and people). The WCED argued that sustainable use of natural resources was impossible in the absence of equity, justice and social and economic development. Environmental issues were thus also social, trade and economic issues. While it would be misleading to trace widespread change to a single report or event, it is nevertheless evident that, as we begin the new century, NRM policy statements from governments, non-government organisations and multilateral organisations alike embrace components of a new 'language' of partnerships, capacity building, institutional support, public participation, community initiatives, environmental health, community health, social capital, international cooperation, education, and a host of concepts and ideas once foreign to the natural sciences.

The social dimensions of NRM are clearly on the international agenda. However, many natural resource managers are confronted by confusion as to what incorporating the 'social' might actually mean. They also face an array of social science disciplines with which they may have had no prior experience. It is not enough simply to get social issues on the agenda and then to commence research in the traditional mould. This ignores the

potential and desirability of having a new set of theoretical and methodological 'tools' available to understand the social factors and processes underpinning resource use management. The role that we envisage for the social sciences in NRM is an ambitious one, but if growing demand for social scientific input is to be satisfied it is incumbent upon social scientists to develop robust and adaptable theoretical and methodological approaches that are appropriate to the understanding and governance of human-environment relationships. Theory-building is not simply an academic exercise with little connection to the practical task of managing resources. It is an exercise fundamental to the conduct of this management in a systematic, reflexive and informed manner. With this in mind, this introductory chapter outlines the theoretical issues raised through the rest of this book. It offers a critical assessment of the implications of these issues for NRM, and suggests areas in which the social sciences may make their most important contributions. One thing that will become clear is that there are potentially many ways in which natural resources might be considered social, and so particular attention is given to highlighting the basic assumptions raised in the various theoretical approaches.

THE ROLE OF THE SOCIAL SCIENCES IN NATURAL RESOURCE MANAGEMENT

There can be no doubt that natural resource management is an inherently social pursuit. But just as the general activity of NRM is pushed and pulled by changing political priorities, policy settings, social values and scientific knowledge, so too is the more specific contribution of the social sciences. In other words, the roles that social scientists have taken in NRM have been very much subject to changing understandings of the relationships between people and their environments and to the power dynamics and projects involved in those relationships. Further, the 'applied' orientation of NRM has placed pressure on social scientists to address the apparently practical issues concerning programme or policy implementation and often to ignore the full complexity of social issues implicated in human-environment relationships.

Nowhere has this been clearer than in 'technology transfer' (TT) and 'barriers to adoption' research. The TT paradigm assumes that problems related to NRM are to be best understood through objective scientific research, the results of which should then be transferred to resource managers for adoption and implementation. Yet, with regard to the difficult issues confronting multiple resource managers, TT has been shown time and time again to fail. It is now accepted that one of the earliest roles that social

scientists took in NRM – research into the ‘barriers to adoption’ of scientifically-designed solutions to scientifically-defined problems – was a flawed part of, rather than a challenge to, the ‘top down’ approach by science.

Adoption research took what might best be described as a social-psychological approach that focused on measuring correlations between the adoption behaviour of resource managers and a range of individual characteristics such as education, socioeconomic status, social participation and so on (Buttel et al., 1990). *TT and adoption research thus dealt with natural resources as social by acknowledging that natural resources are necessarily managed by people.*

While early studies were found to be quite useful in the development of education and extension programmes, they were also criticised for a range of reasons including: (1) an overemphasis on the discovery of associations between variables and frequent failure to identify or theorise causal relationships; (2) a naive acceptance of the desirability of new technologies and a lack of attention to processes of resistance to that technology; (3) a tendency to blame resource managers for the failure to adopt rather than questioning the effectiveness or desirability of the innovation; (4) a lack of attention to the interrelationships between processes involved in technology generation and utilisation; and (5) an inability to deal with complex packages of technological innovation (Buttel et al., 1990; Ruttan, 1996; Vanclay and Lawrence, 1995). Further, the ability of adoption studies to predict adoption behaviour in agriculture, for example, using socioeconomic and social-psychological variables decreased markedly following the 1950s as technological innovation became normalised and the adoption of successful technologies comparatively rapid (Buttel et al., 1990).

The point here is not to develop an extensive critique of the TT paradigm, despite its continued prevalence among scientifically-oriented NRM agencies. It is, rather, to emphasise the potential problems that develop when social aspects are inadequately conceptualised and the social sciences are incorporated into NRM in tokenistic ways in order to help shore up ineffective technocratic programmes. The imperative will always be placed on resource managers to develop practical, implementable strategies – an imperative that will be reflected in the demands resource managers place on the social sciences. The challenge is to construct tools for doing social science that meet this imperative while not becoming a handmaiden to the ‘needs’ of the natural sciences. Only in this way will social science escape incorporation and avoid becoming utilitarian and ‘functional’ for the disciplines with which it interacts. It must, if it is to develop its own critical edge, be in a position to remain conceptually and theoretically sophisticated

in the face of attempts by those in the natural sciences to appropriate – sometimes unwisely – its language and insights.

Fred Buttel takes up this argument in Chapter 2 by arguing that more attention needs to be given in the subdiscipline of the sociology of natural resources to issues prominent in the less practically-oriented environmental sociology. In particular, he is concerned that what may appear to be macro-level theoretical issues such as globalisation and the changing role and shape of the state are used to strengthen and inform the sociology of natural resources. Buttel notes that a sociology of natural resources is well equipped to examine both environmental degradation and protection – provided it engages in a more intimate way with trends in political sociology, and better theorises the role of the nation state. *Natural resources are thus considered social in the sense that their management is governed by social forces and institutions extending beyond the locale of the individual resource manager.*

There is more that can be explored within environmental sociology. A more overtly Marxist political economy, for example, would argue that environmental degradation is virtually inevitable due to the pressures placed on resource managers to increase efficiency in order to maintain profitability in capitalist marketplaces. Dealing with the environmental costs of resource use may be rational in the long term, but in the short term there is more incentive to ignore them or to pass them on (O'Connor, 1993). From this perspective, *natural resources are social in the sense that their management, or mismanagement, is shaped by the contradictory imperatives of capital accumulation.* While many would argue that the externalisation of environmental costs by resource managers should not be regarded as inevitable, it is still surprising how little policy actually attempts to come to terms with the effects of constant drives towards greater efficiency and productivity (see discussions in Redclift and Woodgate, 1997). Indeed, as noted by a number of chapters in this book there is a noticeable trend in policy towards voluntarism, an approach that asks resource managers to improve their practice while offering few additional resources and doing little to change the economic environment. At the very least this suggests an important role for the social sciences in analysing the limitations of NRM policy and programmes that fail to take account of the wider networks of social relationships in which resource managers are enmeshed.

At what is perhaps the other end of the theoretical spectrum is social constructivism, an approach that emphasises the importance of theorising the ways in which environments and resources are understood as cultural or ideological artefacts (Hannigan, 1995). *Natural resources are understood as both symbolic and material entities constructed through processes of social interaction.* Environments are not mere figments of the social imagination, but our understanding of them is necessarily shaped by our values, priorities

and self-identities, as well as by what it is that we think we already know. Despite the aura of objectivity surrounding science and scientists, this perspective argues the importance of coming to terms with the social processes through which knowledge of environments and natural resources has been constructed. Social constructivism does not suggest that scientific knowledge is either naive or fraudulent (see Jakku, Chapter 8), but it does offer tools to understand both: (1) why resource managers so frequently disagree with scientific problem definitions and solutions; and (2) why social movements (such as the environmental justice movement) have arisen over the last decade to contest the knowledge claims of scientific agencies they believe are subservient to powerful vested interests. This analysis is supported by sociological work on risk. Beck (1992), for example, argues that the risks generated by industrial society (pollution, food contamination, nuclear fallout and so on) have replaced natural hazards (such as droughts, floods and earthquakes) as the major threats facing human life. The authority of science has become problematised in sociologically interesting ways for, at the same time that oppositional social movements see institutionalised science as part of the problem, the tools of science have been taken up to criticise the project of modernisation and industrialisation.

As the need to apply the social sciences to the conceptualisation and understanding of resource management issues and conflicts becomes clearer, so too does the need to find ways of integrating social scientific knowledges with other knowledges, a theme taken up in the remaining chapters in Part II of this book. Yet, as Joseph Reser and Joan Bentrupperbäumer argue in Chapter 3, with the exception of economics the social sciences have historically been all but absent from scientific and policy discussions concerning NRM. Further, the particular ways in which multi-disciplinarity has been operationalised within research projects, they argue, has been as much to blame as the skewed priorities of funding agencies. Similarly, in Chapter 4, Luis Llambi and Luis Daniel Llambi draw upon work in the Amazonian region of Latin America to argue that the changes in natural ecosystems brought about by the marketisation of previously subsistence economies demands a transdisciplinary approach by scholars that they believe has so far been lacking. There is much work to be done, therefore, in the development of strategies through which environmental, economic and social sustainability considerations might be incorporated into an analysis of tropical agoecosystem transformations.

Sharon Pepperdine and Sarah Ewing (Chapter 5) take up the Llambis' challenge of transdisciplinarity by evaluating the merit of a number of different approaches to dealing with *social* sustainability. By defining social sustainability as a set of measurable indicators, the authors suggest that 'the social' is more likely to be considered by decision makers in the resource

management arena. We would argue that the current level of interest in social indicators of sustainability – reflected by Pepperdine and Ewing in their analysis of indicator systems including State of the Environment (SoE) reporting, Sustainable Regional Development (SRD), Quality of Life (QoL), capacity for change and community sustainability research – suggests that indicators are useful devices in the new politics of NRM.

One of the remaining questions – one that is taken up by David Brunckhorst and Phil Coop in Chapter 6 – is how these sorts of data might be combined with others in the process of NRM decision making. Brunckhorst and Coop argue that it is necessary to recognise and combine three building blocks of resource governance, namely: the influence of institutional structures; the distribution of social, environmental and political values; and the functional–ecological connectivity between landscape components. Reflecting the perspective of most of the chapters in Part II of this book, for Brunckhorst and Coop *natural resources are social in the sense that biophysical relationships and social and institutional processes are interdependent*. Sustainability is viewed as being dependent on the matching of culturally appropriate local and regional systems of resource governance, and resource exploitation with the bioregional capacity to provide resources and ecosystem services. We do need to be careful here. There is a tendency whenever quantifiable social attributes are identified for the purposes of indicator development or mapping to neglect the more subtle, and yet important, processes through which power and agency are enacted in decision making. This is a theme to which we will return in a number of the following chapters.

PLANNING AND IMPACT ASSESSMENT

Environmental impact assessment in its various guises has become one of the principal ways in which environmental and social concerns are integrated into planning and decision making regarding large-scale infrastructure developments. Some of the more common criticisms of the practice of impact assessment have included the lack of attention generally given to the cumulative impacts of successive developments and the limited attention given to full public participation and the application of local knowledge in decision making. *Natural resources may easily be reduced, in other words, into predictable cogs in a mechanised environment manipulable by expert technocrats*. This results in the marginalisation of less influential social groups and a widespread failure to translate the substantial amounts of work conducted on individual assessments into holistic, long-term, planning processes. Interestingly though, in a number of worldwide legislative

frameworks for impact assessment, social and cultural impacts are explicitly defined as types of environmental impact. In the letter, if not the application, of the law *there is often no rigid distinction between society and nature or between social and natural resources.*

The application of impact assessment is taken up by Wallington and Barns in Chapter 7. The authors question whether a distinctly 'social' agenda can be incorporated into NRM policy practice given the underlying economic rationality of the bureaucratic process. Wallington and Barns focus on Western Australia's system of environmental assessment and argue that, despite the rhetoric of public involvement in environmental decision making, the structures and practices of public participation have been highly vulnerable to co-option by broader economic agendas of government. *An underlying instrumental rationality is evident, they argue, that at one and the same time reduces natural resources to their economic exchange value and public involvement in decision making to a 'thin' procedural politics.* One of the key points to be drawn from this analysis is that much of the 'force' of technocratic approaches to impact assessment and planning lies in the extent to which they appear to 'make sense' from the perspective of instrumental and economic rationality. Developing alternatives requires not simply paying more attention to social impacts, therefore, but changing the rationality that underpins the impact assessment and planning system. Wallington and Barns draw on Habermas (1984) to propose a deliberative discursive rationality of public enquiry that might help to overcome the technocratic and elitist tendencies characteristic of current environmental assessment procedures (see also Dryzek, 1987, 1992). This rationality would shift the focus in impact assessment from the application of science in order to discover the truth about natural resources, to a new *focus on the negotiation of common understandings about natural resources involving multiple stakeholder groups, knowledges and perspectives.*

The potentially tenuous nature of technocratic approaches to impact assessment and planning is further explained in Chapter 8, where Emma Jakku examines the roles of scientists in environmental disputes. Rather than discovering clear boundaries separating the knowledge of expert scientists from that of the public and politicians, Jakku's work demonstrates the contested nature and content of these characterisations. Using the Magnetic Keys resort development in North Queensland as her case study, Jakku employs the concept of 'boundary-work' to examine how scientists construct their roles in environmental disputes variously as providers of independent advice or as advocates of a particular position. She notes that the expectation that scientists will provide objective advice is fraught with difficulties. Where some scientists believed that any involvement in advocacy compromised their position as independent and impartial sources of

information, others believed their understanding of the scientific dimensions of the issue behoved them to become politically involved. In neither case was the unique perspective of science challenged, but its relationship to value judgements and to political processes was clearly contested. If the perspective of Wallington and Barns becomes more widely adopted, scientists will have no choice but to become more directly involved in advocacy and decision making as it will be through these processes that their knowledge is integrated with those of others to generate new understandings and mutually acceptable strategies. As utopian as this might seem, a number of impact assessors have noted the reduction in conflict associated with developments where technocratic approaches have been put aside in favour of more genuine involvement and negotiation (Dale et al., 1997).

Chapter 9 also focuses on planning in resource management. However, instead of examining how assessment procedures might be democratised, the authors seek to develop a broad conceptual framework for understanding formation and change in communities dependent on primary industries or processing of natural resources – what the authors call ‘resource communities’ – for the purposes of providing a stronger basis for social assessment and planning. *Natural resources here are social in the sense that their exploitation is closely linked to the creation and maintenance of nearby communities of workers and their families.* Using a comparative case-study approach, Nick Taylor, Gerard Fitzgerald and Wayne McClintock argue that few rural communities in New Zealand remain dependent on a single resource sector. Changes in technology and the organisation of work, industry restructuring, centralisation of social services and loss of population have all had an impact on the structure of resource communities. These are now less clearly defined spatially by locality, and need to be understood more in terms of networks of localities that interact with extra-local processes. For the authors, this suggests the need for a more dynamic concept of community that accounts for the mosaic of production activities and social relationships within a network of physical settlements. The authors argue that their research provides a useful conceptual and empirical basis for social assessment and resource planning in New Zealand.

A practical means for attempting to integrate multiple perspectives on resource planning, that take into account a diversity of social relationships and productive uses, is proposed by Christopher Irons in Chapter 10. Irons outlines the design and application of PADI, a Performance and Diagnostic Instrument used to formalise and compare social values in relation to sustainability. For the author, this diagnostic instrument allows environmental managers and practitioners to better assess what it means, from the perspectives of different stakeholders, for a catchment to be

'healthy' – at the same time as identifying both the bases for conflict and the impediments to be overcome.

SUSTAINING RESOURCES

While impact assessment tends to focus primarily on large-scale infrastructure developments, NRM activities related to enterprises such as agriculture and forestry are, of course, more diffuse. Chapter 11 provides a provocative introduction to issues associated with agriculture by focusing on biodiversity as the key to sustainability of rural communities. This may not seem like a novel suggestion in itself, but it is an important one due to its positioning of *natural resources as social through the complex networks of relationships that characterise ecological processes*. In contrast to the mechanised and manipulable environments of technocratic and instrumental rationality, this approach emphasises the complexity and indeterminacy of socio-ecosystems. However, rather than suggesting that biodiversity needs to be preserved at all cost, David Bates and Terry Tucker note that human occupation inevitably leads to some alteration of landscapes. Using an example of the Philippines-based development programme known as Conservation Farming in the Tropical Uplands (CFTU), the authors argue for a much more modest approach to sustainability that, while recognising biodiversity as a worthy goal in developing rural communities, takes into account the constraints posed by the immediate needs of rural people, and the non-government organisations and government agencies that serve them. The task of academics here is to refine the parameters within which the conservation of biodiversity may realistically proceed, rather than to produce idealistic models of sustainability. How, though, we might ask, are we to determine what is 'realistic'? Perhaps here the answer might lie in ideas of deliberative rationality and their operationalisation through tools for participation such as Irons' Performance and Diagnostic Instrument.

Chapter 12 also takes up the issue of landscape as a site of conflict over values. Ruth Beilin argues that there exists in Australia a diversity of landscapes that are constituted through trade and agricultural policy decisions, as well as by local people. The author draws attention to how changes in landscape reflect power relations and, in turn, how this affects production regimes and land management. Taking catchment management in Australia as an example (known as watershed management in the US and elsewhere) Beilin argues that a participatory rhetoric of 'local knowledge', 'partnerships' and 'ownership of issues' has been used by government to distract attention from the penetration of these landscapes by transnational capital. The mechanism through which this has occurred, she argues, has

been a network of unelected Catchment Management Authorities that prioritise state expenditure on NRM initiatives. Barbara Geno, in Chapter 13, also develops the idea that the profit-making imperatives of transnational capital have influenced resource management policies and programmes but, in this case, in the context of the emergence of 'managerialism' as a strategy to regulate Australian forest industries. Managerialism is based on the idea that public sector agencies should adopt similar practices, organisational structures and accountability procedures to the private sector, and that economic efficiency should be considered an achievable endpoint in itself. Geno notes, however, that there is a potential conflict between bureaucratic discourses of 'managerialism' and attempts to institute and regulate sustainable development. For example, the focus on process rather than outcome in ISO 14001 Environmental Management Systems means that the objective of environmental sustainability becomes reframed within a language of efficiency, measuring, and monitoring. Similar to Wallington and Barns in Chapter 7, Geno argues that this creates a situation in which the process of cost-effectiveness, driven by a calculative rationality, is privileged over goals of ecologically sustainable development.

The theoretical approach developed by Vaughan Higgins, Stewart Lockie and Geoffrey Lawrence in Chapter 14 suggests that in terms of the processes through which the pursuit of profit seeking becomes institutionalised in NRM, Geno's identification of managerialism as a way of 'thinking' NRM is ultimately more convincing than Beilin's identification of top-down control by government. This is not to suggest that different actors have equal access to resources of power, but rather to suggest that power does not reside in a central repository from which NRM may be controlled. Reflecting the resources available to both groups, relationships between governments and agricultural land users in Australia (and elsewhere) have been characterised by a diversity of frequently unsuccessful strategies to influence NRM practice. Rather than equating sustainability with 'local' knowledge, and efficiency with 'scientific' knowledge and macro-social forces, Higgins, Lockie and Lawrence argue that both have been used simultaneously in attempts to govern Australian agricultural environments. Using the case study of a local 'action-learning' initiative in the cotton industry, the authors show how state agencies attempt to shape farmer behaviour by influencing the environment in which they make decisions and the ways in which they understand – and, therefore, respond to – that environment. But knowledge creation and dissemination is far from a linear 'top-down' or 'bottom-up' process and concessions may need to be made by all parties in order to operationalise a particular initiative. Similar to the constructivist perspective outlined above, *natural resources are thereby considered social in the sense*

that their management is shaped by the heterogeneous strategies through which 'sustainable knowledge' is created.

INSTITUTIONS AND REGULATION

Debate over appropriate institutional structures for sustainable NRM is frequently concentrated on Hardin's (1968) thesis of the tragedy of the commons, the essence of which is the argument that when a resource is owned in common, the rational course of action for each individual with access to that resource is to increase her or his exploitation of it. Even when widespread over-exploitation and degradation of the resource becomes evident, individuals continue to increase their exploitation because the costs of their actions are shared by the whole community while the benefits are appropriated individually. In this manner, the common property resource is eventually destroyed. But as a number of authors have pointed out, Hardin confused common property resources, to which access is regulated by common property institutions, with unregulated open-access resources. In Chapter 15, Phil Coop and David Brunckhorst show that common property institutions have a proven track record of sustainable management and are still widely found today. Applying these insights to rural communities, Coop and Brunckhorst argue that common property institutions can provide a realistic basis for maintaining the ecological and social fabric of such spaces, and may also minimise the effects of rural decline. Obviously, the establishment of common property institutions has a number of limitations and the authors take these to include issues relating to enterprise consolidation and operation, establishment of managing bodies, and identification of key infrastructure and equipment. Despite these limitations, Coop and Brunckhorst point to the many benefits of common property resources. These include the efficient management of resources without affecting land tenure, the efficient utilisation of labour, the buffering of long-term risk associated with primary production ventures and collective decision making, and the greater sustainability and efficiency offered by the larger land area.

In contrast, Kate Brinkley, Melanie Fisher and Sonia Gray argue in Chapter 16 that an evaluation of common property resource management suggests that the key issue is the development of models by which decision makers can better understand and predict natural resource interactions. These authors are thereby more pessimistic than Coop and Brunckhorst about the potential of common property institutions. Using a complex adaptive systems approach, the authors argue that effective resource management policy requires an understanding of the links between the social, biophysical

and economic drivers of behaviour. These are conceptualised as interdependent factors that form a complex adaptive system. The adaptive nature of such systems means that policy makers have to become used to formulating policy in an uncertain environment. However, we would argue that, while on the surface the importance attributed here to relationships between social, biophysical and economic factors seems reasonable enough, there is a danger that the behaviourist assumptions underlying this argument may favour technocratic attempts to intervene in resource management in ways that actually ignore the wider social context within which resource managers find themselves. It is for this reason that some systems theorists have sought to abandon the cybernetic models guiding that approach in favour of hermeneutic models based on similar notions of discursive rationality to those developed by Wallington and Barns in Chapter 7 (see Jackson, 1990; Martin, 1991; Ulrich, 1988). The emphasis from this point of view would be less on the ability of policy makers to predict resource manager behaviour and more on processes of negotiated 'meaning making' with those resource managers.

Bruce Moon takes up this concern with the role of policy makers in Chapter 17 by assessing the implications of post-structuralist theory for public sector management of natural resources. Moon argues that a paradigm shift has occurred in the way government administration is theorised. Rather than 'rational choice' underpinning decision making, administration is characterised by a choice between prescriptive models or a 'best fit' approach in which the relative 'goodness' of a policy reflects culturally-defined influences. This means that natural resource managers must rely less on the most logical or 'rational' outcome and more on the ideologies and expectations of other actors involved in the network. Moon's central point is that more attention needs to be given by policy makers to the action and culture of other actors within policy networks rather than relying on prescriptive models for policy formulation and implementation. However, while Moon presents this as a case of what policy makers *ought* to do, Lynda Herbert-Cheshire demonstrates in Chapter 18 both that it is already the case that policy makers avoid prescriptive models, and that the models they do use raise a number of further issues concerning power and knowledge (see also Higgins, Lockie and Lawrence, Chapter 14). Specifically, Herbert-Cheshire examines the discourse of community self-help, which has become increasingly prevalent in recent years. She argues that programmes of 'self-help' are more complex than a simple 'empowering' of community groups. In a similar vein to Chapter 14, Herbert-Cheshire argues that many community-focused programmes entail various forms of 'action at a distance' through which state agencies attempt to shape the ways in which individuals make their decisions. Herbert-Cheshire sees community

development 'experts' as key agents in the formation of entrepreneurial attitudes. These 'experts' attempt to train individuals in the 'art' of self-government. Self-help, therefore, focuses on the building of 'active' subjects who can achieve the aims of government without direct regulatory or fiscal intervention. This is viewed, in critical fashion, as encouraging local people to work within the existing economic and political environment – rather than to provide a challenge. It also structures the field of possible action by denying the rationality of alternative resource management practices. This is not to suggest that there is something sinister or underhand here, but that processes of control are more complicated than the linear processes implied by top-down or bottom-up models.

CONCLUSION

Returning to the question that heads this chapter it is now possible to identify a number of ways in which natural resources are conceptualised as social. In summary, it can be seen that these conceptualisations revolve around three key questions: the relationship between people and nature; the management of those relationships; and the processes through which knowledge is generated about those relationships. Perspectives on the relationship between people and nature range from those that argue that there is no essential difference between society and nature, through those that consider biophysical, social and institutional processes to be interdependent, to those that reduce nature and natural resources to their economic exchange value from an exclusively human perspective. Clearly, one of the common threads running through the chapters of this book is a critique of the latter perspective and an assumption that society and nature are closely interrelated. To those involved in natural resource management this may seem self-evident. But what if we were to take the more radical perspective that there is no essential difference between society and nature? What tools would we have as social scientists to deal with such a perspective? Although such a perspective has not been taken up in this book we believe it is one that deserves greater attention. The recent popularity of Actor–Network Theory (see Lockie and Kitto, 2000; Murdoch, 1997) in some academic circles shows that it is possible to develop sociological accounts of change that neither privilege the agency of humans over non-humans, nor fall back onto crude behaviourist versions of environmental determinism. The task remains to apply such insights to the more preemptive research required to inform NRM.

A further – apparently self-evident – statement is the proposition that natural resources are managed *by people*. Certainly, none of the chapters in

this book directly challenges this proposition. But again, we need to treat it critically. Individual natural resource managers do not exercise absolute control over mechanistic systems. Rather, they are faced with indeterminacy, uncertainty, and a range of social and political imperatives. NRM strategies focused solely on resolving discrete technical or scientific problems or on changing the behaviour of individual resource managers ignore the full complexity of the decision making environment faced by those managers. Clearly, there is a role for social scientists in improving our understanding of this environment. However, there is an even greater role, we would argue, for the social sciences in problematising what it is that we 'know' about NRM and how it is that this knowledge has been constructed. The role that we envisage here is not one based on deconstruction for its own sake – positioning social scientists as a bunch of killjoys ready to dismantle scientific knowledge claims and point out the unintended consequences of policy interventions (although all these activities may be legitimate and necessary). The social sciences offer powerful tools with which to construct more holistic understandings of NRM issues, to pursue discursive rationality and to encourage widespread participation in NRM decision making. By acknowledging the jointly material and symbolic dimensions of natural resources the social sciences are uniquely placed to understand and to translate the competing knowledge claims and value judgements that often characterise environmental conflicts. This does not deny unequal access to resources of power, but it does potentially provide a basis for negotiation by giving voice and legitimacy to alternative knowledges and, thus, a genuine alternative to technocratic agendas.

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