

**Report for the South Australian Department of
Environment and Natural Resources**

**A business case for social science support in
DENR operations**

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on behalf of

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RESEARCH WITHOUT BOUNDS



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Executive summary

1. Background

1.1 Introduction and aims

The South Australian Department of Environment and Natural Resources (DENR) is an organisation created from the former Department of Environment and Heritage having taken on the State's responsibilities for natural resource management (NRM). While there are many overlapping concerns between environmental and natural resources management, they represent different conceptual, ideological and cultural perspectives that DENR is helping to bridge through its organisational structure, policy and program management and business processes (modus operandi).

As part of this bridging effort, DENR is exploring the disciplinary needs of its policy, program management, public engagement and communication functions. The Department is well served by its well renowned scientific capacity, with many of its management and operational personnel being highly trained in the biological and ecological sciences. However, with new NRM functions being embedded into the organisation, it has become timely to review the benefits of incorporating, or at least accessing, a wider range of disciplinary perspectives, especially from the social sciences.

To this end, EcoInsights and Kiri-ganai Research Pty Ltd have been engaged to articulate the business case justifying the incorporation of the social sciences into the DENR's business processes. This business case is to set out:

- What the social sciences are;
- Why they need to be integrated into the Department's business (including using some case examples of where this has successfully occurred);
- Costs/benefits (conceptual rather than financial) of integrating social, economic and biological / ecological understanding (particularly to the development and implementation of policy); and
- First order recommendations (the recommendations being about what DENR should put in place, including institutional arrangements) to create holistic, balanced and integrated decision-making processes that inform policy and on-ground management.

1.2 Approach to the task

The study is a very brief one and relies heavily on the practical experience and theoretical knowledge of the consultants and the personnel of DENR. The consultants engaged in this study have disciplinary backgrounds spanning the ecological and social sciences. Both have managed multi and interdisciplinary teams at the highest levels in scientific and policy institutions. The approach focuses on the process of disciplinary engagement, be it within DENR or between the Department, its related institutions and its stakeholders. All care has been taken to avoid any bias towards particular disciplines in the process of policy and decision making, however, it does present a case for the incorporation of the social sciences in the overall disciplinary perspectives required to carry out DENR business processes.

The project was carried out over May 2011, and involved:

- an initial inception meeting (teleconference) to clarify DENR needs and expectations;
- a review of the literature on the social sciences' contribution to environmental and NRM policy, including case studies of successful contributions;
- a review of DENR documents including corporate plan, annual reports (of DEH) , policy preparation templates etcetera;
- a broad ranging teleconference discussion with DENR managers to seek current perspectives on policy development and implementation within the Department; and
- submission of an initial draft report on 20 May for DENR consideration and feedback.

2 Definition of social science and its cognate fields

This section explains and discusses what is meant by social science and key related terms. The consultants have not stopped at defining social science as some terms such as *integration* are used extensively in the terms-of-reference while others such as *interdisciplinary* address the emphasis in the terms-of-reference holistic decision making processes.

From a disciplinary perspective, the fields of environment and NRM can be characterised as falling within the domain of the physical and biological sciences (hereafter biophysical) or the humanities and social sciences.¹ Biophysical research explores events, processes and relationships within and between elements of the biological and physical world. Research in the humanities and social sciences explores human individual and social behaviour and culture. The terms-of-reference specify a focus on the social sciences and not explicitly the humanities, although some disciplinary fields including history are represented in both the humanities and the social sciences. Where broad disciplinary approaches have been applied to environmental and NRM policy, the experience suggests that the emphasis on social science over the humanities is appropriate.

Table 1 summarises the main fields of interest explored in this report and for each provides examples of the substantive areas for concern and key associated disciplines.

2.1 Definitions – social science

There is no single, authoritative definition of social science; however it is generally agreed that like the term biophysical *science*, *social science* represents a collection of disciplines, in this case disciplines that deal with society and the human condition. The key element is a focus on human behavior and those disciplines that explore human behavior in some detail. A secondary element is a focus on those institutions which humans create and the culture related to the various ways that people live.²

In the context of contributing to the notion of *evidence-based policy*, there is considerable emphasis on social science research that provides verifiable evidence about human behavior and how such evidence can be used in policy to organize and order society for the better. Social research also explores forms of knowledge and bases of understanding and perception, issues useful in coming to terms with how problems are defined and perceived and hence how solutions can be constructed and implemented. Altogether this suggests that the broadly social disciplines relevant to defining social science include sociology, anthropology, political science (policy and institutional), economics, law, demography, human geography and psychology.

2.2 Definitions – cognate disciplines

The two social science disciplines that have had the most influence on policy over the past century have been economics and law. Economics concerns the allocation of scarce resources to satisfy alternative and often competing human wants, while law concerns itself with the codification and regulation of individual, social and institutional behaviours and relationships.

Traditionally economic research has been framed within a highly rationalistic, prescriptive outlook (i.e. based on the assumption that people and markets behave rationally or in a predictive way). The more recent development of non-market and ecological economics has been motivated particularly in response to environmental and NRM policy.

Likewise, legal research traditionally has been concerned with the discovery and explication of the law relating to a particular issue (what the law 'is'), including the identification of gaps and inconsistencies at a formal level, through analysis of the relevant legislation and case law. The

¹ Mobbs, C, et al, 2009

² Robinson, WC, 2007

more recent ‘law in context’ movement goes beyond this, to investigate how law and legal processes operate in practice.³

Closely related to these, policy and institutional research (political science) serves analytical and/or prescriptive purposes examining public policy processes, public administration and program delivery, and the institutions wherein these operate (be these formal or informal, legal or economic, inclusive or exclusive, etcetera.).

2.3 Definitions – concepts of disciplinary collaboration

This report uses the terms *multidisciplinary* and *interdisciplinary* in relation to how different disciplines can collaborate in the business processes of DENR.

Multidisciplinary research refers to the non-integrated use of several disciplines to examine different aspects of a problem or question. For example, specialists in each component discipline undertake work in their area of expertise with little or no reference to other disciplines. While multi-faceted, there is no great attempt to integrate the different perspectives. Multidisciplinary research is relatively common.

Interdisciplinary research refers to the use of an integrating theory or framework to link two or more disciplines, such that experts in each field work together to address a problem, or such that a single researcher draws on the different disciplines to address a problem. A relatively low level of interdisciplinary research is conducted in Australia relative to single discipline and multidisciplinary work.

Transdisciplinary research is similar to interdisciplinary research, but has the additional objective of developing new theory, methods or understanding that is not just a simple combination of the component disciplines, and is required to comprehend new problem types. Transdisciplinary research is relatively rare, and because of its emphasis on theory rather than practice it may be less relevant to the business processes of DENR.

Approaches and methods in inter- and transdisciplinary disciplinary R&D are still evolving and rarely uncontested.

Table 1: Characterisation of social science and cognate disciplines relevant to environmental and NRM policy (after Mobbs et al 2000)		
Disciplinary field	Examples of substantive areas of concern	Examples of key disciplines in NRM
Social	Human organisation including group processes, communication, values, learning, adoption, knowledge, decision-making, conflict resolution, equity, power, social impact assessment, risk assessment.	Sociology, psychology, anthropology, human geography, history, philosophy, demography.
Economic	Identification and measurement of economic values, efficient allocation of resources, property rights, public goods, externalities, economic role of government, macroeconomic policy.	Economic theory, environmental and resource economics, ecological economics, econometrics, microeconomics, macroeconomics, institutional economics, political economy, public finance.
Policy and institutional	Policy and political processes, institutional settings, organisational arrangements, program evaluation.	Planning, history, political science, public policy, public administration, law, economics (public choice), institutional theory
Legal	Analysing/describing what the law is, clarifying interrelationships between different pieces of legislation, identifying gaps between law/legal processes as an instrument of social policy in comparison with alternatives.	Law, justice and legal studies, law enforcement, sociology, criminal justice studies, criminology, public policy, public administration.

³ Mobbs, C, et al, *ibid*

3 The role of social science in environmental and NRM policy and decision making

3.1 Why do environmental and NRM issues need social science perspectives?

Social sciences are seen by many to provide hope for dealing with complex and intractable problems where the interests of nature, communities and economies collide and often compete. As can be seen in the definitions in the preceding section, many of its disciplines have evolved to become more relevant to environmental and NRM issues. Many observers of science pinpoint a distinct transition of the social sciences from being focused on basic research to applied research, or more pertinently to useful applied research, taking place in or around the 1970s when many of its constituent disciplines became interested in studies on property rights and co-management⁴. Part of the need for this transition arose from the perceived failings of the biophysical sciences alone to resolve environmental problems⁵ and part from the social sciences' complementarity with emerging forms of governance and decision-making in NRM⁶. A brief historical perspective is provided in Box 1.

Box 1: The transition of the social sciences in adapting to environmental changes⁷

The real interest in environmental issues started essentially in the 1970s when the growing recognition of a worldwide environmental decay and of severe resource depletion (in combination with a population explosion) received an unexpected but welcome support in the oil crisis. This sudden event was complemented by the First Report to the Club of Rome ('The Limits to Growth'), which was based on a scenario analysis with a systems dynamics model of the World.

This [the 1970s] also marked the beginning of the social science interest in environmental sciences. Economists constructed abstract models of economic growth and resource use and developed a theory of environmental policy for correcting environmental externalities. Economists and psychologists began to investigate how people value environmental change, environmental policy and ecosystem management, using stated preference and revealed preference methods. Demographers started to investigate the relationship between resource scarcity, population growth and migration. Decision theorists tried to develop new tools for policy-making that were more tuned to the often qualitative and unpriced nature of environmental goods (such as multicriteria and multi-objective decision tools). Many disciplines worked together in integrated modelling and assessment, addressing both ecosystem and global scales (climate). Finally, statisticians became involved in the formidable task of developing new statistical data that would map out and monitor energy use, environmental deterioration and the like. So, in some 25 years time there has been an explosive interest among social scientist in environment and resource issues.

The failure of the biophysical sciences to resolve environmental issues should not be seen as a failure of the disciplines themselves or the quality of the research but rather a failure in the interpretation of science into policy⁸ and the failure to recognise the value of methodological approaches other than those considered positivist (see Box 2). Much of this failing is not about the absence of interpretation, but rather the subjective nature of interpretation. Indeed, the complex nature of many of the environmental issues being faced by society, and by organisations such as DENR, is characterized by high degrees of uncertainty, which makes interpretation difficult⁹. Uncertainties do not sit comfortably with policy processes¹⁰. Neither do they sit well with many natural resource managers, including farmers, who are sometimes called upon to make investment decisions using their limited resources and with outcomes that

⁴ Symes, G, 2005

⁵ Symes, G, *ibid*

⁶ Gibbons, M, et al 1994

⁷ Draws from Dasgupta, P and Heal, GM, 1979; Baumol, WM and Oates, W, 1988; and Hanley, N and Spash, CL, 1993

⁸ Luks, F and Siebenhuner, B 2007

⁹ Funtowicz, SO and Ravetz, JR, 1993

¹⁰ Dossey, L, 2010

are far from clear. In some cases, the benefits may be realised elsewhere and by others in disproportion of the investment made. Interpreting science into policy that take into account public response is not easy and requires an understanding of public and social processes.

Box 2: A Question of methodology¹¹

A frequent response to calls for change in NRM is one that is based on a rationalist assumption that the problem is one of methodology and we need to develop new techniques and incorporate these into our 'scientific tool kits' (eg. adding qualitative methods). The scientific method or 'positivism' modelled after the biophysical sciences remains as the predominant philosophy. However, this response is seen by many to be inappropriate and inadequate given the unknowable and unpredictable nature of the 'poorly-structured problems' that characterise current issues in NRM. A supposedly superior alternative such as 'post-normal science', wherein judgment plays a recognised part, is attractive but has yet to be clearly outlined. However, consensus has it that such superior approaches will need to involve 'methodological pluralism'. The danger, according to some commentators is that if applied social science is simply constructed within the constraints of an existing positivist model, it will be marginalised.

Non-government stakeholders are crucial to environmental solutions and these stakeholders are not necessarily science-centric but see the world more broadly. When issues are complex and science has not delivered certainty, many in the public view the divergence of scientific opinion (a natural part of science as it debates its way towards consensus) as disunity. And when science is seen to be the only informer of policy, it is all too easy for science sceptics to criticise policy, no matter how well founded the science underpinning it is.

Involving the stakeholders of NRM agencies in decisions and/or management is an activity that has grown considerably over the past two decades. This is due to a mixture of circumstances including increased access to information, increased media presence, changes in the role of traditional structures in communities, the presence of protest movements and a new sophistication among interest and lobby groups¹².

The term *public participation* is used loosely and rhetorically by many public institutions, and as a result issues about who should participate and how they ought to participate are not always dealt with effectively. The tendency is to lump many diverse groups with varying interests into this amorphous entity. Terms such as *interest groups*, *end-users*, *stakeholders*, and *community* are often used interchangeably or without an adequate definition that provides a clear sense about who specifically is being referred to. This lack of specificity may be a significant impediment to the identification of those ultimately affected by public policy, and to the establishment of pathways that foster public acceptance of and appropriate responses to policy.

An important job of the social scientist in the NRM field is to evaluate the effectiveness of communication between the agency and the targeted community as well as to help define the participatory processes that align the right process to the right audience.¹³ As experience has shown in the development the Basin Plan for the Murray Darling Basin, not getting the participatory process right can result in policy being discredited on highly emotive rather than rational grounds, and can also lead to the underpinning science itself being unfairly discredited. The Basin Plan is a good example of a 'decide and defend' approach to policy formulation and implementation. An alternative approach is outlined in Box 3.

For better or worse, the social sciences are seen by many as being more aligned than the biophysical sciences to the political process. While policy is more than politics, politics remains an important part of policy formulation. It is because many of the social sciences explicitly study the political and policy process, they can be adept at speaking the language of policy and hence can be important in the process of interpreting science for policy as discussed above.

¹¹ Draws from Mobbs, C et al; 2000, Patterson, M and Williams, D, 1998; Norgaard, R, 1989; and Boggs, 1992

¹² Buchy, M and Ross, H, 2001

¹³ Roughley, A, 2005

Box 3: An alternative to the *decide and defend* approach to engagement¹⁴

In 2008, Western Power embarked on the public consultation and approvals phase of the largest transmission line project undertaken in Western Australia in 20 years. Two plausible routes had been identified for the powerlines upon which the community and affected stakeholders would be consulted.

Yet Western Power elected not to take a conventional ‘decide and defend’ approach – telling stakeholders of their plans, then mitigating the worst effects arising from stakeholder feedback, thereby adding time and cost to the project. Instead they met with people along the transmission line corridor to understand their interests, needs and places of value. By mapping that information, new insights and cost effective options emerged to shape route selection, while preserving stakeholders needs and values. This ‘co-design’ approach was so effective that no objections were received during a period of public exposure, and the government deemed an environmental impact assessment (EIA) was not required. Stakeholders were happy, and Western Power reduced their development time, cost and business risk by avoiding what could have been an adversarial process.

Having the ability to interpret human behaviour is the prerogative of the social sciences. In broad terms, the social sciences offer criticism and evaluation, and provide a context for human activity. That is, social sciences can frame the context in which other knowledge can be applied; questioning the fit between that knowledge and its context and evaluating its purpose; and providing a critique of science and technology which is valuable as an input to technological decision making from the beginning, not just to explain what went wrong.¹⁵

Incorporating social science into policy, resource management and scientific institutions dealing with the environment and NRM is not new. For many organisations, it has been the business processes they have adopted that have demanded this incorporation. These business processes go under many terms — integrated catchment management, integrated environmental management, ecosystem integrity, ecosystem health, adaptive management, ecosystem management—but all share some core characteristics. These characteristics include: integrating disciplines, integrating management and policy across landscapes and catchments, matching quantitative and qualitative forms of analysis, and balancing economic, social and environmental aspects¹⁶.

3.2 Key areas where the social sciences make their contribution

A review of the literature suggests that there are three key areas where the social sciences can make a contribution to environmental and NRM policy include defining problems, defining solutions and facilitating the uptake of solutions.

Defining problems

Unlike the biophysical sciences, some social sciences work from the basis that knowledge is socially constructed and that problems too are socially constructed. Here the assumption is that environmental issues and their solutions do not exist a priori but are constructed by the participants involved in defining the problem at hand¹⁷. At the most superficial level, a problem is only a problem in the context of individuals, communities or societies perceiving a phenomenon to be a problem. The fact that something may not be quite right in the physical and natural sense still does not make it a problem, although it may justify an investment in pure science to define *what is*. A different proposition altogether is to define *what should be*.

From the perspective of this study, this is highly relevant, as it is not the role of DENR to merely understand the scientific basis of problems, but to understand what solutions should be put in place. This requires both a scientific and social understanding of problems. Box 4 provides broader understanding of the term understanding.

¹⁴ Flemming, N, 2011

¹⁵ ASTEC, 1993

¹⁶ Mobbs, C, et al, *op cit*

¹⁷ Steyaert, et al, 2007

Without knowledge of the social context within which problems are defined, the interdependencies between understanding *what is*, *what should be* and *how do we get there* are weak. In this sense, defining solutions is both dependent upon and subject to iterative reconsideration of defining problems. Where problems are characterised by uncertainty leading to controversy, disagreement and conflict between interests and perspectives, people are usually compelled to take action. Such action might be thought of in terms of defining research questions, but is better thought of in terms of negotiating agreements that build a shared appreciation of reality, including the reality that many phenomena, or more pertinently the meanings attributed to many phenomena, are viewed quite differently according to the influences of social and cultural context.

Box 4: Understanding is everything¹⁸

The principle differences between the natural and human sciences theories revolve around the idea that human conduct is based on meaning and intentionality, factors that do not have physical referents, are not amenable to objective experimental analysis, and do not appear to follow causal laws. Where natural science theories see causal scientific laws as their essential feature, human science tends to see understanding as its central feature.

The social sciences in investigating any phenomenon can add explanatory power¹⁹. The more disciplines that contribute to this explanatory power, the better, as this helps define the pathways to solutions, even if the solutions may no longer involve all the disciplines that helped define the problem in the first place. In this respect even the most constructivist (or anti-reductionist) of social sciences can help the biophysical sciences prioritise questions in their positivist domain.

Moreover, because problems are also defined by their local context, it is critical to broaden the concept of explanatory power to include local, tacit knowledge. The need for local engagement in problem definition has another important driver that can be seen emerging particularly from complex issues such as climate change. Complex issues are often characterised not only by the uncertainties associated with particular phenomena, but also by uncertainties about what the science is saying. Under such circumstances, interpretation becomes a social and political process²⁰. This problem can be exacerbated not only by lack of knowledge, but also by an *excess objectivity*, where the body of scientific knowledge is so broad that different components of the knowledge can be selected to create different meanings and competing views²¹ (see Box 5).

Box 5: An excess of objectivity²²

As an explanation for the complexity of science in the political decision making process, the “excess of objectivity” argument views science as extracting from nature innumerable facts from which different pictures of reality can be assembled, depending in part on the social, institutional, or political context within which those doing the assembling are operating. This is more than a matter of the selective use of facts. The point is that, when cause-and-effect relations are not simple or well established, all uses of facts are selective.

Defining solutions

The social sciences are no different to the biophysical sciences when it comes to basic and applied research and analysis. A fundamental question for any organisation prior to investing in social science research or analysis is whether such should be whether the investment is in social science *per se* or whether it is in a holistic approach to policy development and implementation. Box 2 warns of the risk of marginalising the social science expertise, and therefore the value of

¹⁸ Greer, S, 2005

¹⁹ Lund, et al, 2005

²⁰ Sarewitz, D, 2004

²¹ Sarewitz, D, *ibid*

²² Sarewitz, D, *ibid*

the investment, by taking the former approach. The latter approach places an emphasis on the applied aspects of the social sciences being integrated into the very fabric of an organisation's business processes. It calls for interdisciplinary approaches to defining solutions to problems.

Previously it was discussed that many of the social sciences speak the language of policy; but they can more. Social sciences can play a role in the choice of policy instruments to address problems defined by the biophysical sciences; for example, advising on the efficacy and impact of different taxation regimes, technical and product standards, subsidies, tradable permits, deposit-refund systems, self-regulation via covenants, and joint implementation²³. In economic theory, efficiency has been the dominant policy selection criterion. In practice, instrument choices will also be influenced by other criteria, such as effectiveness (relating to uncertainty, monitoring and control), equity (social and political feasibility), sustainability (ecosystem stability and resource availability) and international feasibility (agreements, laws and policy coordination). Consideration of such criteria is a role where the social sciences can assist.

Investment in social science can include investment in governance solutions, such as processes for enabling solutions to be developed and implemented within the context of competing problem definitions, competing theories and competing interests. This starts to delve into processes of public engagement covered below. It is raised here to suggest that the development of solutions should not be distinguished from the definition of the problems to be solved and from the way in which they are to be solved. In a practical sense, this Mobius strip like approach doesn't just happen; it requires leadership, structure and facilitation in which biophysical science, social science and lay expertise can combine their perspectives.

Facilitating implementation

Many of the social sciences have been transformed in the later part of the twentieth century by their focus on co-management and other forms of governance within the context of dealing with problems defined by society through the political process. A considerable amount of social science research in the context of Australian NRM has focussed on Landcare, catchment management and broader regional governance. What comes through a good deal of it is the perspective of natural resources managers that research is best performed when it is collaborative, interdisciplinary and participatory. In other words, the value of research is not valued so much for its disciplinary leanings, but by how it contributes to building understanding and finding solutions in the context of practice. Such insights are important in the policy formulation process as well as in research.

Social science can act to influence the broader frameworks within which policy, management and NRM decisions are made. It can explore the nature of decision support system development, their role in environmental and NRM education and extension, and their impact. Often good environmental management is contingent feedback loops, adaptive management and continuous learning, but these require the leadership, structure and facilitation discussed above. Most importantly, they need to be considered at the policy design stage rather than as a belated response to a decision (see Box 3 on the decide and defend approach to engagement).

Insights gained from social research suggested that the principles for effective environmental governance are less about structure than they are about harnessing collective wisdom and using such wisdom in adaptive frameworks. This is consistent with contemporary research findings which find that the social sciences have a role in the harnessing process (Box 6).

Box 6: The wisdom of crowds²⁴

A overlooked influence in the recognition of collective consciousness is the development within the social sciences of dialogue and group processes as ways of promoting consensus, creativity, and problem

²³ Dovers, S, et al, 1996

²⁴ Dossey, L, 2010; and Suawieki, J, 2004

solving. Organisations are discovering that when individuals unite in a shared intention, something mysterious happens: a group intelligence emerges that transcends that of the individuals involved, a theme developed by James Surowieki in his courageous book *The Wisdom of Crowds*.

It is not uncommon for researchers and policy makers dealing with the public to hear the cry “*We do not need more research and planning; what we need is better communication!*” This cry is by no means new, however many of the communication processes used in environmental and NRM policy have been driven from narrow decide and defend perspectives. Worse, these processes have not always taken on board age old communication. For example, how many times have we seen variations of Box 7 suddenly found, ignored and lost, only to be re-found:

Box 7: From the communication archives of 1966²⁵

The five themes (of effective scientific communication) are: (1) The desirability of taking a system view of scientific communication in any discipline, (2) Several channels may act synergistically to bring about the effective transmission of a message, (3) informal and unplanned communication plays a crucial role in the scientific communication system, (4) Scientists constitute publics, and (5) Science information systems serve multiple functions.

An important part of policy and program implementation is assessing the impact of the policy or program. This has three dimensions; one of accountability, one of ensuring no unintended negative impacts result, and one of ensuring that lessons from implementation feed back into the policy process in a form of continuous improvement. Social scientists have an important part to play in all three of these dimensions, including in their design.

The consultants are not particularly religious, but we would argue that if religion were simply a means of explaining phenomena, or the meaning of life, then it would have made its statements, done its job and allowed its followers to simply get on with the task of living with the benefits of this knowledge. Why the constant re-affirmation, rediscovery and reflection? It is because these are an important part of learning and this shouldn't be seen as any different in the interpretation of science and social science through the policy process.

²⁵ Dossey, L, 2010; and Suawieki, J, 2004

4 Lessons from case studies of incorporation of social sciences²⁶

The case studies

4.2 Lessons: What difficulties are experienced in incorporating social science perspectives?

Institutional/Organisational Arrangements

Institutionalising social science in NRM remains a considerable challenge. The experiences and perceptions of social scientists and managers who participated in a study by Alice Roughley²⁷ in 2005 reveal a number of persistent institutional/organisational constraints to integration. They are as follows:

- Fragmentation of policy and management functions in corporatised organisations can compromise the potential contribution of the social sciences to natural resource management.
- Introduction of neo-liberal, rationalist economics to natural resource management has resulted in less direct contact between resource management agencies and resource users and a consequent knowledge management cleavage.
- The tendency of agencies to focus on outputs, organisational arrangements and activities, instead of achievements, veils their commitment to advancing the human dimension of natural resource management.
- Corporate reporting formats make it difficult to ascertain where social science is located in an agency or its activities there.
- A tendency to measure success in terms of short-term outputs compromises potential to secure a place for social scientists in natural resource management agencies whilst the contributions of social science (eg. behavioural change) are typically long-term outputs.
- Rationalist economic models introduced during the early 1990s saw public involvement diminish, denying the principle that stakeholder involvement is essential to improving management practices.
- Agencies introduced social scientists with scant idea about what 'social science' is, what social scientists could do or how they would do it and who were therefore uncertain about where or how social science fitted into the agency.
- There has been little effort to structure a link between social science and either the communications / education sections or the advisory groups of the agencies, although both have a substantial part to play in advancing knowledge about the human dimension of natural resource management.
- Some 25 years of experimentation have seen social science sitting beside and across, but not quite together with the biophysical program areas.
- Project participants viewed disciplinary silos as the significant integration problem, but the greatest issue appears to have been the absence of connectors between them.

²⁶ The material in this section draws heavily from a study by Dr Alice Roughley of five NRM institutions which had attempted to incorporate social science perspectives into their business operations. These institutions included the CSIRO, the Great Barrier Reef Marine Park Authority, the former Murray Darling Basin Commission, the WA Department of Resources Development and the Qld Department of Family Services and Aboriginal and Islander Affairs. The reference is Roughley, A, *op cit*

²⁷ Roughley, A, *op cit*

- Integration of social science within the contemporary ‘matrix’ model of natural resource management agencies can result in social science becoming invisible.
- Natural resource management problems are conceived in bureaucracies that promote competition internally between programs and sometimes externally for investment, even though there is evidence that horizontal teams are best to foster integration.
- Agencies have failed to establish facilities for knowledge exchange between the social sciences and the biophysical disciplines.
- With a single social science position, agencies fail to provide reasonable personal and professional infrastructure for social science to have real influence. The expectation of the agencies was that social scientists as solo workers without status would work across the organisation whereas all the other single-focus, biophysical programs were represented at a high decision-making level in the agency by coordinators or directors with a higher status.
- The number of social scientists and resourcing of their programs has not kept pace with agencies’ stated plans for an increased focus on and integration of the human dimension. Resources for social science programs were extremely limited in all six cases studied.

Professional Impediments

A range of professional impediments to integration were also identified including:

- ‘Hard science’ is the entrenched culture in the natural resource management field. Managers of social scientists have difficulty in convincing biophysical scientists that concerns with human behaviour are not just a matter of common sense but require the specialist expertise of social scientists.
- Lack of clear role definition for social scientists has resulted in unrealistic expectations and made it difficult for other agency staff to grasp where social scientists fit and what they do.
- The participatory approach that behavioural scientists often adopt threatens the centralising tendency of bureaucracy.
- The natural resource management field has limited experience in applying sound social theory and established social science methodologies.
- The tendency to conceptualise social science as ‘servicing’ natural resource management detracts from the fact that the social sciences are disciplines in their own right. As long as social science is cast in the role of ‘service provider’ to the biophysical science programs and projects, it is maintained with less than equal status to them.
- A common assumption over the last 25 years has been that the social scientist in natural resource management will not only coordinate the social science function but also coordinate integration. The onus for integration has fallen upon the social scientist to a greater degree than it has been the responsibility of the agency or of other disciplines.
- It is unrealistic to expect a single social scientist to combine the functions of research expert and change manager.
- Social scientists have not had recognised status in natural resource management agencies because they have not held senior positions or designated programs.
- Since the agencies have not established well resourced social science programs, social scientists have not had sufficient influence to establish large-scale research or to demonstrate their specialist knowledge

4.3 Lessons: What conditions are required to facilitate incorporation of social science perspectives?

In the same study by Dr Alice Roughley, the experiences of the social scientists and managers interviewed reflected factors and conditions that have enhanced integration of the social sciences into their institutions. Positive integration experiences include the following:

- Responsibility for integration of social science essentially lies with agencies but all players must ultimately share the responsibility. However, agencies themselves need to take primary responsibility for determining the infrastructure to enable integration.
- Social scientists have more chance of becoming integrated where they have clear and realistic job descriptions based on awareness of what social scientists can do and the myriad social science approaches available.
- Building and maintaining strategic and personal relationships and establishing trust are critical for social science to make a successful contribution in the natural resource management field.
- Social scientists need a professional sense of place and an expert profile before they can establish their role in natural resource management.
- Irrespective of the formal arrangements for social science in natural resource management, a professional home and personal support are essential to the survival of the social science disciplines in the natural resource management agency.
- Establishing a social science team creates opportunities for collaborative development of social science theory and method directly relevant to natural resource management and gives presence to the social science disciplines in an agency.
- Organisational arrangements that identify the most logical relationships between social science, the key objectives and actual functions of the agency and other program/disciplinary areas are most conducive to integration.
- Formal, high-level structures where the social science disciplines have a degree of professional independence enhance the professional profile of social science.
- Multidisciplinary, project-based teams facilitate relationship building and knowledge sharing among disciplines.
- The social science profile is boosted where the social scientist visibly assists agency stakeholders (ie. industry and community).
- The social science profile is boosted where the social scientist attracts external funds to the agency.
- Opportunities for social scientists to market their own research expertise assist in establishing acceptance of social science among biophysical scientists.

Based on Roghley's study, the following key recommendations for improving integration of the social sciences into NRM institutions were offered:

- Social science, with its policy dimension, must be applied simultaneously to both policy and management if it is to influence natural resource management directions.
- Natural resource management agencies have a responsibility to acquaint themselves with social science theory and methods if they are to be effective in serving their multiple and diverse stakeholders.
- Structured opportunities for knowledge exchange among different disciplines will assist integration.
- Where an agency requires someone to undertake the role of integrator specifically, the task must be clear. The role of integrator may but will not necessarily be a social scientist. Whoever is chosen needs to be a strong advocate for inclusion of social science.
- To have influence, social science requires adequate resourcing and equal status to biophysical programs.
- In addition to a dedicated social science program, continuing involvement of social scientists in strategic research planning, and construction and assessment of project briefs in all program areas, would provide a channel for transmission of the theoretical knowledge and methodological expertise that social science brings to natural resource management. It would also offer settings for interdisciplinary knowledge exchange and relationship building. It is essential that social scientists be involved in problem/project definition, not 'tacked on' later.

5 The business case: A Social Science Policy Framework for DENR

5.1) Where social science can contribute to DENR objectives

DEH's Corporate Plan focuses organisational effort around five goals:

- South Australians involved;
- A healthy environment;
- Sustainable growth;
- Better decisions and partnerships; and
- Getting results

Corporate goal	Conceptual challenges that could be addressed by the social sciences
South Australians involved	Who specifically gets involved? How do they get involved? What will motivate them to be involved? What are the risks of poor engagement?
A healthy environment	What is perceived as a healthy environment? Who determines the criteria for a healthy environment? Who should be involved in monitoring? Who should be involved in translating monitoring data and determine the responses required?
Sustainable growth	What is meant by sustainable growth? How does DENR views of a contentious issue fit with other views? How can consensus on a way forward be achieved?
Better decisions and partnerships	For whom or what are better decisions made? What are the trade-offs in any decision – who wins and who loses, and how are impacts dealt with? How can partnerships be formed and nurtured to be mutually rewarding?
Getting results	What are the drivers of and barriers to successful

	implementation of policies and programs? How can the benefits of results be sustained?
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5.2) Integrating natural and social science knowledge in DENR. What institutional changes or improvements will facilitate the incorporation of social science disciplines into policy direction and environmental management decisions

- Internal integration of social science
- External relationships with social science institutions
- External relations requiring social science engagement methods

5.3) How to measure success. What would the significant difference be compared to current business practice

Preoccupation of natural resource management agencies with the notion of organisational structure and restructure diverts them from simpler and more obvious solutions for integrating social science. The first question is how can the profile of social science be increased so that it influences the achievement of the agency mission? This project illustrates the potential that exists to incorporate social science and the biophysical disciplines in natural resource management. There are a number of essential facilitators of integration. The primary consideration is that agencies take responsibility for integration through meeting some significant pre-conditions for inclusion of social science.

Building relationships and establishing trust are critical for social science to make a successful contribution in the natural resource management field. If agencies truly believe that social science is integral to all aspects of their mission, their greatest gain may be through demonstrating their commitment to and trust in social science.

No longer will it be an unformed add-on. Relationship building across disciplines takes time. However, this study indicates that time is only one factor. A professional sense of place and an expert profile will support entry to new relationships. Instituting a strong social science program will depend on agencies knowing what they want social science to do and articulating complementary roles and tasks.

It is important that natural resource management agencies acquaint themselves with social science theory and methods if they are to be effective in serving their multiple and diverse stakeholders. There are enough social science experts in the natural resource management field to advise agencies on what they can realistically expect of particular social scientists. The outcome may be greater job satisfaction and security for social scientists and more rigorous structures to support integration.

The broad catch-all role of social science must be replaced with some clear definitions based on awareness of what social scientists can do and the myriad social science approaches available. The expectation that one psychologist, for example, can undertake research, establish communications pathways with all the stakeholders of the agency, service the multiple biophysical programs and ensure that they all integrate the human dimension is both unrealistic and unreasonable. Where an agency requires someone to undertake the role of integrator specifically, the task must be clear. The role of integrator may, but will not necessarily be a social scientist but will need to be a strong advocate for inclusion of social science.

6 Recommendations

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SOCIAL IMPACT UNIT WESTERN AUSTRALIA 1989-1992

In the early 1980s, a Labor Government was elected in Western Australia. One of the Labor Government's election platforms was to create a new and better Environmental Protection Act. The new Act came into effect in 1986 and was administered by the Chairman of the Environmental Protection Authority (EPA), Barry Carbon, (who had been Geoff Syme's manager when Geoff started at CSIRO), and his head of assessment, Rob Sippe. The legislation was intended to be easy to implement for the government and workable from a proponent's point of view.⁸² By 1999 it had become apparent that implementation of the Act was impeded by public controversy over proposed development in Western Australia, particularly large-scale resource development, such as mining.

Towards the late 1980s, there was a plethora of proposals for large-scale development projects in Western Australia. A number were proposed but had stalled through embattlement between developers and community opponents. A particularly controversial impact assessment development was the proposed Muchea Synthetic Rutile Plant, north of Perth. There had been much community outcry about the social effects of that development, particularly the potential effects it would have on the rural character of the area. Public objection to the proposal caused much political unrest. The Environmental Protection Act was not addressing these problems as anticipated. The definition of 'environment' in the Act included people, but the EPA did not have the expertise to implement the human dimension of 'environment' as specified in the Act. There was no history in Western Australia of Environment Departments working with communities on 'people issues'.

"What we found was that most of the people who were opposed to these developments were saying, for example, 'We're opposed to this development because it's going to affect the ground water or the air' [the biophysical environment] which is what they thought they needed to say to come under the Environmental Protection Act. When the WA EPA examined their concerns, the water wasn't going to be affected and the air wasn't going to be affected. When you went to talk to these people, they were really concerned and scared about the nature of change the development would create for them and their community. So, they were often more concerned about kids getting run over in the main street by trucks from the development, rather than ground water pollution etc. When you're scared and you feel you don't have a voice in the process, you grasp at anything. ... It became obvious, particularly to Barry Carbon and to Rob Sippe, that there was a need for better involvement of people in the process so the decision-makers actually understood what people's concerns were and that people had a process by which they could express their concerns in a true way."⁸³

The Minister for Resource Development in Western Australia at that time was also the Deputy Premier, David Parker. He was sympathetic to the environment and supportive of the EPA and the Act but at a time when about 85% of the gross domestic product in Western Australia came from resource development—not just mining but gas, timber and down-stream processing—he was very frustrated by the growing controversy and project delays. He gave full support to the suggestion put to him by Barry Carbon and his then adviser, Anne Verschuer, for establishment of a social impact unit. Anne had responsibility for establishing the unit within the Department of Resources Development and in 1989 became the founding Director of the unit with a direct line of reporting to the Deputy Premier.

The Unit drew its power from and worked under the Environmental Protection Act 1986 (WA). Through the Act, the Social Impact Unit was empowered to require development proponents to undertake a social assessment of their proposed development.

The mission statement of the Social Impact Unit was:

To ensure that development projects are good for the people as well as good for the developers.⁸⁴

The Unit's objectives read:

- Those who have an interest are able to make informed, fair judgements on social issues.
- Government agencies, communities and developers involve the public in decision making.
- Developers address the social impact of their proposals in the best interests of the community.
- Communities can readily access opportunities created by development projects.
- Social issues relating to developments are managed in a consistent and planned manner.
- Systems of social impact assessment and management are efficient and effective.⁸⁵

In 1991, the Unit consisted of six staff. Anne Verschuer was the manager. Joanne Beckwith had a Masters in environmental psychology and experience in environmental impact assessment and social impact assessment

in Canada. Michael Ashford, Jennifer Duffecy and Gerard Fitzgerald were planners with a strong interest in both socially and environmentally acceptable outcomes of development. Lisa Pollard brought a community development and an anthropological perspective. The agency was arranged in a fairly horizontal structure. Anne required the staff to have a number of generic qualities (see Chapter Three). She assigned projects based on staff expertise, personal qualities and interest.

The unit primarily took an objective stance to facilitate public participation in development planning to educate proponents, agencies and communities to work in cooperation. A substantial function of the unit was to assess social impact assessment reports to ensure that potential social impacts of a proposed development were identified, negotiated, and mitigated to the optimum level. The goal was to support approval for developments that were socially acceptable. Development proponents were required through the EPA to come up with solutions that were acceptable to the community. In effect, the unit had two clear roles. The first was to facilitate public participation or public problem solving and the other was formal assessment.

Before the establishment of the Social Impact Unit, the proponent went to the EPA with an established proposal for a new development. The company developed these plans in-house without community consultation. Sometimes they would have locked themselves into a specific site by purchasing land and they were heavily committed at this stage to the proposal in the form they had presented, so the development was a fait accompli.

The EPA would decide on a level of assessment appropriate for the scale of the development and give them guidelines to work with for the formal documentation and assessment. At this point, when the proposal first went to the EPA, it was often the first the community knew of the project. Public concern was, at this stage, based on rumour because they did not have access to all the facts. Once complete, the company presented its documentation to the EPA, which would release the report for public comment. It was at this time that the controversy level was highest. Groups would refute the company's information and present alternatives. Then the EPA would assess the report and the public submissions, and report to the government on the project's acceptability. The government made the decision about whether the project would proceed. This represented a very limited public opportunity for input or influence in relation to how the development proceeded and how they would protect their interests and aspirations.⁸⁶

Once the Social Impact Unit was operational the EPA required development proposals in very early draft stage. They set guidelines for environmental assessments that would be required and formally referred the proposal to the Social Impact Unit for recommendations for social assessment processes that were indicated. The Social Impact Unit then wrote the social considerations for incorporation in the EPA guidelines, which were public documents.

The unit closed following a change of government in Western Australia in 1992.

An odd but very true story told by a social scientist to set the scene:

Over the years I've introduced my wife to a few interesting characters from my days living in Nagasaki, Japan., but none odder or more curious than Kunio-san, a distinguished Professor of Pharmaceutical Sciences. Kunio-san is well into his 60s, and is just about to retire.

Kunio-san is a very intelligent man. It's as well he is, for he is leading certain lines of enquiry in important cancer research. Despite his intelligence, Kunio-san failed his driver's licence test nine times in Japan. He gave up. But whilst on sabbatical in the USA, he had another attempt and passed first time. It was in a State where seat-belts were not compulsory at the time. It may also have been a State where licence testing standards were among the world's most questionable.

During 40 years of driving, Kunio-san never wore a seat-belt. He still doesn't. He says it's uncomfortable. Personally, I think it's a case of feeling natsukashii (a nostalgic longing for the old days living in the USA).

Wearing seat-belts in Japan is compulsory. Of all the Japanese I know, Kunio-san should be the first to wear a seat-belt. Kunio has no hesitation in stopping his car in the middle of the road to look at a map. He will do this in fast flowing traffic on city freeways. He will do this on blind hair-pin corners on dangerous mountain roads. The man is oblivious to danger (and common sense!)

Road rules seem, in his case, to be optional. Yet diversion from scientific method in his view is not. Despite his driving, Kunio-san is methodical in all things. It's his way of finding the truth.

The day my wife met Kunio-san was the day before the Okunchi festival in Nagasaki. Okunchi is the city's most important and vibrant festival. It is centred in the forecourt of Suwa-jinja, Nagasaki's oldest and most important Shinto shrine. For two years I lived within 200 metres of the Shrine and had participated in the many events associated with Okunchi. After leaving Japan, I vowed to return, if only for the festival.

On the inevitable return visit to Nagasaki, 18 years later, I had arranged for Kunio-san to organise festival tickets so I could take my wife. This he did. But worried that two foreigners attending such a crowded event might be overcome and get lost, he insisted on showing us where we should go on the following day.

Kunio-san drove us there.

He drove up the steep and narrow driveways into the Shrine grounds.

He drove past the 'Do not enter' signs.

He drove into the very forecourt itself.

The forecourt was blocked on all sides other than that through which he entered. The forecourt was a confined space, requiring a 20 point turn to get out.

In the centre of the forecourt was a television crew and a reporter, at that very moment reporting live to the evening news on the coming festival.

Strewn across the forecourt were electrical cables linking lights, camera, sound and, ultimately, action.

Inside the car was one mad Professor with two highly embarrassed gaijin (foreigners) wanting to hide well below windscreen level.

Outside the car were cables being crushed under the weight of a vehicle doing its 20 point turn.

Production staff and Shinto priests alike waved their fists in anger. Kunio-san smiled, revealing little embarrassment.

All this was beamed live-to-air to the citizens of Nagasaki!

And what is the lesson to be taken from this story? Here's one view. Behind science there will always be scientists, with all their eccentricities. Behind scientists there will always be society, with all its idiosyncrasies. And behind society there will always be humanity, with all its foibles. If the social sciences achieve nothing else, it may bring humanity to the ways in which problems (including environmental) are defined and resolved.

Richard Price, May 2011

