CIRM Social Dimensions of Natural Resource Management Working Group

Monograph Series

Regional Natural Resource Management Planning: the challenges of evaluation as seen through different lenses

Papers from An Occasional Symposium held 15 October 2004 by CSIRO Sustainable Ecosystems, a partner in the CIRM Social Dimensions of Natural Resource Management Working Group

Edited by Jennifer Bellamy

June 2005

Consortium for Integrated Resource Management

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CIRM Social Dimensions Working Group

The Social Dimensions of Natural Resource Management Working Group is the first of several working groups established through the Consortium for Integrated Resource Management (CIRM). CIRM operates as a formal linkage mechanism through a network of key officers from its eight partner organizations - four Universities (University of Queensland, Griffith University, Central Queensland University, James Cook University), CSIRO and three government departments (Natural Resources and Mines, Primary Industries and Fisheries and Environment Protection Agency). It has evolved as a mechanism for facilitating the planning and coordination of collaborative research initiatives.

CIRM identifies priority research areas in natural resource management (NRM) with the Social and Community Dimensions of NRM as the first area for which a cross agency/institution working group developed a position paper. The CIRM Board endorsed funding to establish the working group to implement priorities and to enable the networking that is an important resource for continuing work in this area. The group contains representatives of the CIRM partner organizations and they are: -

Professors Geoff Lawrence and Helen Ross for University of Queensland
Professor Roy Rickson for Griffith University
A/Professor Stewart Lockie for Central Queensland University
Derek Foster for Department of Primary Industries and Fisheries
Jenny Bellamy for CSIRO
Jim Binney for Department of Natural Resources and Mines (Chair)
Lyn Aitken Department of Natural Resources and Mines (executive officer for the group)
The Environmental Protection Agency is not currently represented

The position paper identified a framework of research topics, as six clusters of research areas: -

1) Understanding communities as a basis for achieving sustainable natural resource management
2) Structuring and supporting partnerships for natural resource management
3) Institutional arrangements for natural resource management
4) Supporting community and institutional capacity for natural resource management
5) Addressing the social impacts of resource use and change
6) Awareness and action to facilitate social change.[1]

The priorities framework is disseminated in a number of ways. A publication that compiles research that spans those cluster areas is the Social Innovations of NRM: A Handbook of social research in natural resource management [2]

The framework of priorities is also a basis for the group to hold symposia as one of the networking activities of the group and as a means of promoting current and future research effort in the social dimensions of natural resource management.

Each of the partners takes primary responsibility for holding a symposium in a chosen area of interest. The first symposia was held by the University of Queensland around the theme of the first cluster "Understanding Communities as a basis for achieving sustainable natural resource management" with the second symposia "Innovations in Indigenous Engagement" held by Department of Primary Industries and Fisheries under the second cluster of priority research topics in the group's framework.
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This symposium hosted by CSIRO is the third in the series. It addresses topic areas under the fourth cluster, "Supporting community and institutional capacity for natural resource management" and will be the first to be published in this CIRM Social Dimensions of Natural Resource Management Monograph Series.

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[1] L. Aitken (2001) *Social and Community Dimensions of Natural Resource Management*. CIRM Occasional Paper. State of Queensland (Department of Natural Resources and Mines, ISSN: 1445-9280) also available in pdf on www.cirm.org.au

[2] Richards, C and Aitken, L (eds.) (2004) *Social Innovations in Natural Resource Management: A Handbook of Social Research in Natural Resource Management in Queensland*, State of Queensland (Department of Natural Resources and Mines, ISBN: 1 920920 83 8) also available on www.cirm.org.au and www.regionalnrm.qld.gov.au

1. Introduction: Setting the scene

Jenny Bellamy
CSIRO Sustainable Ecosystems Brisbane

Regional policy frameworks are now widely promoted in Australia by federal, state, territory and local governments as strategic responses aimed to deal with global pressures, accelerating technological advances, increasing productivity growth from commodity sectors, and other pressures on sustainable development (e.g. SCARM 1999; The Parliament of the Commonwealth of Australia 2000, 2000b; MDBC 2001; AFFA 2000; BTRE 2003; ALGA 2005). The increasing focus on regions is a result of a number of factors including:

- Globalisation and the re-emergence of the local and regional economy as an important unit of innovation;
- Increasing recognition of the broad spatial and regional nature of many key social, economic and environmental issues; and
- Increased community demand for more targeted economic strategies, responsive public policy and greater accountability.

A multiplication of regional programs by both state and federal governments in and since the 1990s has seen the emergence of a proliferation in regional governance frameworks. These new frameworks are reflective of a global trend of devolving specific decision-making closer to its source or context for core policy areas right across the triple bottom line: environment (e.g. environmental protection and natural resource management (NRM) policy); economic (e.g. industry and employment policy); and social (e.g. integrated service delivery). For example, national programs such as the *National Action Plan for Salinity and Water Quality* (NAP) and the extension of the *Natural Heritage Trust* (NHT2) are now the main drivers for regional natural resource management planning throughout Australia.

In particular, considerable investment, both private and public, is currently being made in regional approaches to natural resource management and planning in Australia based on the devolution of decision-making to more collaborative, communicative and knowledge-based regional approaches that support learning through adaptive management (e.g. AFFA 1999, 2002; MDBC 2001; Bellamy *et al.* 2002). These approaches are promoted as important mechanisms for addressing both conflict in multi-stakeholder contexts and the management of complex evolving natural systems to achieve a sustainable future. Notwithstanding, emerging regional governance arrangements in Australia and internationally are experiencing significant social and institutional challenges (e.g. Wondolleck and Yaffee 2000; Bellamy *et al.* 2002; Connor and Dovers 2004; BTRE 2003).

Evaluation is central to identifying change, supporting an adaptive approach that is flexible enough to meet the challenge of change, and enabling progressive learning at individual, community, institutional and policy levels. However, these new regional governance approaches challenge conventional thinking about success and failure and policy or program effectiveness and appropriateness. As such, they require new approaches to evaluation. Importantly, they provide challenges for players at all levels:

policy development, plan development and implementation. There are also challenges presented in managing for specific purposes, landscapes or groups.

To explore some current thinking and experiences on evaluation of regional natural resource management planning in Queensland, CSIRO Sustainable Ecosystems, Brisbane, and the CIRM Social Dimensions Working Group sponsored an Occasional Symposium on 15 October 2004 on "Regional Natural Resource Management Planning: the challenges of evaluation as seen through different lenses" held at the Queensland Bioscience Precinct, University of Queensland, St. Lucia. It was attended by over 70 NRM policy makers, practitioners, researchers and others actively involved in regional NRM planning in Australia.

This monograph presents the eight papers underpinning presentations made at the symposium. They have been peer reviewed by at least one independent reviewer. The papers focus on the issues and challenges of evaluation of the context, process and impact of regional natural resource management planning in practice based on experiences in Queensland that also have national relevance. They discuss challenges experienced by those involved in the process at a local, regional and state level, those managing protected areas and indigenous involvement; and thus offer a view into this system through a range of 'lenses'. The final paper summarises some of the key issues raised in discussions with symposium attendees.

References

Agriculture, Forests and Fisheries Australia (AFFA) 2000. *Our Vital resources: National Action Plan for Salinity and Water quality in Australia*. October 2000.

Agriculture, Forests and Fisheries Australia (AFFA) 2002. Framework for the Extension of the Natural Heritage Trust.

Australian Local Government Association (ALGA) 2005. 2004-05 *State of the Regions* report. https://www.alga.asn.au/sor/2004/

Bellamy, J., Ross, H., Ewing, S. and Meppem, T., 2002, *Integrated Catchment Management: Learning from the Australian Experience for the Murray-Darling Basin. Final Report. January 2002.* A Report for theMDBC. CSIRO Sustainable Ecosystems: Brisbane. http://www.mdbc.gov.au/naturalresources/icm/icm_aus_x_overview.html

Bureau of Transport and Regional Economics (BTRE) 2003. *About Australia's Regions*. May 2003. (BTRE: Canberra). http://www.btre.gov.au/docs/regstats/regstats_03.pdf

Connor, R. and Dovers, S. 2004. *Institutional Change for Sustainable Development*. Edward Elgar Publishing: Cheltenham: UK.

Murray-Darling Basin Ministerial Council, 2001, *Integrated catchment management in the Murray-Darling Basin 2001-2010: Delivering a sustainable future.* Murray-Darling Basin Commission, Canberra.

Parliament of the Commonwealth of Australia 2000a, *Co-ordinating Catchment Management. Report of the Inquiry into Catchment Management.* House of Representatives Standing Committee on Environment and Heritage: Canberra, December 2000.

Parliament of the Commonwealth of Australia 2000b. *Time Running Out: Shaping Regional Australia's Future.* Report of the Inquiry into infrastructure and the development of Australia's regional areas. House of Representatives Standing Committee on Primary Industries and Regional Services. February 2000. Canberra, Australia.

Standing Committee on Agriculture and Resource Management (SCARM). 1999. *Managing Natural Resources in Australia for a Sustainable Future. A discussion paper for developing a national policy. Agriculture*,.Fisheries and Forestry – Australia (AFFA).

Wondolleck, J.M. and Yaffee, S.L. 2000. *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*. Island Press: Washington, D.C.

2. Through multi-scaled lenses: A systems approach to evaluating natural resource management policy and planning

Jenny Bellamy and Geoff McDonald

CSIRO Sustainable Ecosystems, Brisbane.

Introduction

Over the past decade or so in Australia, we have been experimenting with a range of new policy approaches to regional natural resource management and planning to achieve long-term sustainable use of natural resources. Based on the devolution of decision-making to more collaborative and communicative partnerships and learning through adaptive management, these new regional policy approaches are promoted as important tools for resolving conflict in multi-actor contexts and managing complex, inter-connected and evolving natural and social systems (eg. AFFA 1999; Wondolleck and Yaffee 2000; Bellamy *et al.* 2002; Dovers and Wild River 2003).

The implementation of the new regional NRM policy models both in Australia and internationally is proving a difficult challenge for the individuals, the institutions and the communities concerned and as a consequence, actual impact is often perceived to fall short of expectation (eg. Bellamy *et al* 1999, 2001; Born and Genskow 1999; Wondolleck and Yaffee 2000). For example, the myriad of policy and planning activities comprising the regional NRM policy system (e.g. water planning, integrated catchment management, vegetation management planning, biodiversity management, local government planning, regional growth management frameworks, integrated regional planning, coastal management planning) are confronted by numerous and often conflicting social and institutional challenges including:

- The need to balance traditional business and industry development interests with social and environmental constraints;
- Conflicting approaches to the recognition of cultural diversity and difference;
- Contest over the optimum degree of community ownership and commitment in the setting of regional priorities;
- The adequacy of regional shares of public revenues, resources and regulatory powers; and
- Developing whole-of-government responses to regional demands.

Our knowledge of what works, what doesn't, and if it works, why, and how it could work better, is limited. This paper argues that such difficulties can be attributed in part to inadequate evaluation of the efficacy of the regional policy system that can contribute to on-going improvement in regional NRM policy and planning. Importantly, the new regional NRM policy and planning models challenge conventional thinking about success and failure, and effectiveness and require a new approach to evaluation (Bellamy *et al.* 1999; 2001).

Regional NRM Policy and Planning: A Complex System

The long-term sustainability of regions depends on the functionality and health of the overall system of regional policy-making and planning. The regional natural resource management policy and planning environment is a complex system characterised by a number of core elements (eg. Bressers and Kuks 2003; Dovers and Wild River 2003):

- Multiple levels of policy implementation;
- The multi-actor character of policy implementation;
- Multiple perceptions of the problem and the objectives of policy implementation;
- Multiple strategies and policy instruments for policy implementation; and
- The complex multi-resourced and multi-organisational basis for implementation of policy.

Like all systems, the natural resource management policy and planning system consists of apparently discrete components or activities interacting with each other (e.g. Bellamy and Dale 2000). These activities may relate to three core policy areas: environment (e.g. environmental protection, natural resource management policy); economic (e.g. industry and employment policy); and social (e.g. integrated service delivery). Understanding the essential properties of this system comes from an understanding of how the parts or components operate collectively together, and not from an examination of the parts themselves in isolation. In practice, the regional policy system therefore can be described as numerous 'nested' planning activities being carried out concurrently across a range of functional scales (eg. federal, state, region, local) and across a number of different dimensions across the so-called quadruple bottom line (eg. social, economic, environmental, institutional/political). These are presented in Figure 1.

General systems theory developed in the 1930s and 1940s emphasises connectedness, context and feedback (e.g. Lee 1993; Berkes *et al.* 2003). With the science of complexity, a new understanding of systems is emerging to augment general systems theory (e.g. Gunderson and Holling 2002; Berkes *et al*. 2003). A complex system is characterised often by nonlinearity, uncertainty, emergence, scale and self-organisation. From a complex systems approach, 'wicked' problems such as NRM planning and policy issues are seen to be embedded in systems that are characterised by complexity, fragmentation, and uncertainty and in which learning, feedback and adaptation take place through highly linked self-organised networks (e.g. Lee 1993; Gunderson *et al.* 1995; Berkes *et al*. 2003).

Phenomenon at each functional level identified in Figure 1 will tend to have their own emergent properties, and different levels may be coupled by feedback relationships. As such evaluation criteria or measures of system function (i.e. social, economic, biophysical, institutional) may not necessarily be aggregated from a smaller scale to higher scales (or disaggregated from a higher scale with integrity. Therefore complex systems should be analysed and managed simultaneously at several levels (Berkes *et al*. 2003). Importantly, at each level there are different problems, different questions to be asked and different theories to be formulated (Gibson *et al.* 1998).

Across the different functional levels (e.g. federal to local and vice versa) there will be an iterative process of devolution and feedback of functions as illustrated in Figure 1.

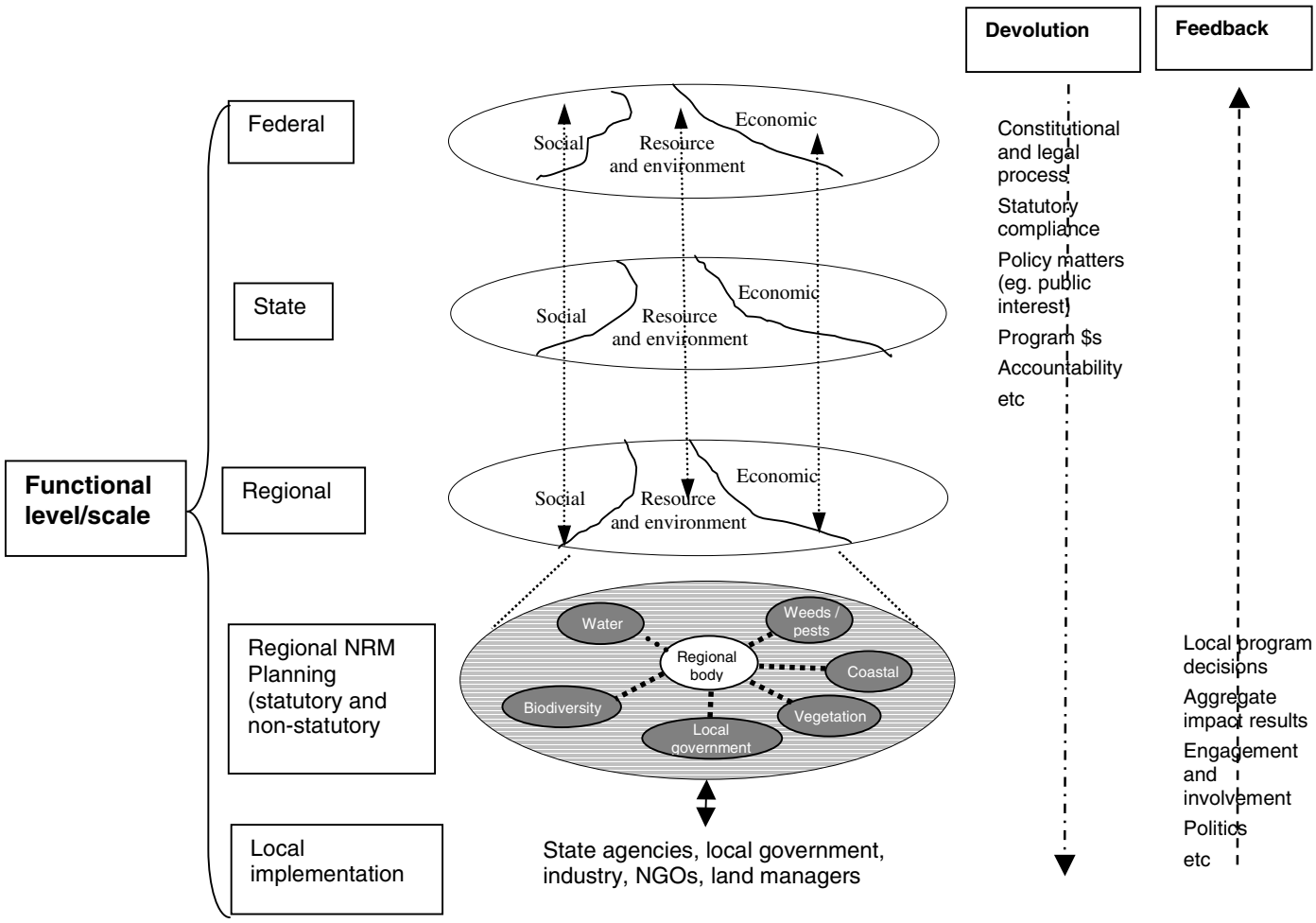


Figure 1. Regional NRM Policy system – evaluation through different lenses

Evaluation Challenges of the Regional NRM Context

Based on a consideration of the changing approaches to NRM policy and planning and observations and experiences particularly in the practical assessment of collaborative regionally based NRM in Australia, Bellamy *et al.* (1999; 2001) recognise a number of operational challenges to NRM evaluation in practice:

(a) *Multi-dimensionality of impacts:* The impact of an initiative is likely to be multi-dimensional, encompassing, for example:

- Individual and organisational learning effects (e.g. new collaborations, partnerships or strategic alliances, networking);
- Behavioural changes (e.g. new skills, new planning processes, sharing of information);
- Impacts on norms/standards (e.g. new ways of technical assessment, accessibility of information, policy directions, service priorities of government);
- Social effects (e.g. changed social networks);
- Contributions to knowledge bases or scientific progress; and
- Resolution or amelioration of resource use problems (eg. improved water quality, rehabilitation of riparian vegetation).

(b) *Intangible objectives and outcomes*: Many policy programs and planning processes have vague and even unrealistic aims and objectives. They often arise from political compromise and may even be internally inconsistent. In addition, many of the important measures of effectiveness or success are intangible, making the identification of appropriate criteria for evaluation difficult.

(c) *Short term needs versus long-term impacts*: Impacts or outcomes of natural resource and environmental policy initiatives almost always take a considerably long time to be realised and may only become visible beyond the lifetime of any evaluation.

(d) *Causality*: Understanding of causality is essential for designing effective initiatives based on policy instruments that can produce the required change. There is, however, often considerable ambiguity associated with cause-and-effect relationships in natural resource and environmental problems, which involve dynamic, complex, multi-dimensional processes that are invariably affected by a number of diverse factors. Consequently, it is not generally possible to provide definitive answers on causality and to identify the difference that particular policies or programs can make to what would have happened without them.

(e) *Evolution or drift in objectives*: There are difficulties related to the dynamic context of implementation of natural resource and environmental policy and planning and the potential for changing 'fit' of objectives with instrumental assumptions and context. These changes may relate to different political priorities or different economic conditions. For example, a policy initiative may, at inception, have clear relationships between issue, intent, assumptions, criteria and context. At a later date, the issue and intent may have evolved markedly either in conjunction with, or independently of, changes in context. However, instrumental assumptions and evaluative criteria may not have co-evolved, leading to a complex distortion that needs to be dealt with in the evaluation process.

(f) *Multiple perspectives on criteria for success:* In the case of policies promoting ecological sustainability by multiple stakeholder participation, the 'views' of the policy objectives and the criteria of success of the different stakeholders may be quite diverse. Establishment of an evaluation framework, which includes the perception of stakeholders according to their functions within the overall system can be problematic. Depending on one's role, there may be subtle or distinctly different priorities for outcomes and even on criteria for measuring whether the outcomes have been achieved. These differences may be necessary for the healthy functioning of the system as a whole but they make evaluation as pluralistic as the policy development and implementation process itself.

A systems approach to evaluation of regional NRM policy and planning has the potential to address some of these issues, to identify a wider variety of outcomes (eg. social, political, economic, environmental, institutional) and to develop a more robust understanding of regional NRM policy and planning processes.

A Systems-based Evaluation Framework

A recent review of changes and new directions in evaluation theory and practice recognises the importance and broadening role of evaluation in public policy:

> …evaluation – not only for the purposes of accountability and good management, but also for knowledge building and sharing, for institutional learning and development, for

> governmental and democratic reform through the serious examination of public policy – has become a precious tool (Chelminsky, 1997: p.6).

The challenge to create policy processes, institutional arrangements and NRM practices that can contribute towards achieving sustainable and equitable resource use outcomes requires monitoring and evaluation of the context, process and impact of NRM policy and planning as part of the change process (e.g. Lee 1993; Wondolleck and Yaffee 2000; Bellamy *et al.* 1999, 2001; Innes and Booher 1999). Monitoring and evaluation is fundamental to identifying change, supporting an adaptive approach that is flexible enough to meet the challenge of this change, and enabling learning at individual, community, institutional and policy levels (Bellamy *et al.* 2001).

As opposed to a more traditional program evaluation model of inputs and outputs (eg. Department of Finance 1994), new approaches to natural resource management evaluation focus on a *systems* perspective (eg. Bellamy *et al*. 1999, 2001; Innes and Booher 1999). From a complex systems perspective, phenomenon occurring at any one level are affected by mechanisms occurring at the same level, by the level immediately below, and the level immediately above (Gibson *et al.* 1998). Because of the multiplicity of scales, there is no one 'correct' and all-encompassing perspective on a system (Berkes *et al*. 2003). One can choose to study a particular functional level of NRM policy and planning (eg. local, regional, state, federal) but the perspective from that particular level will be different from the perspective from another. Moreover, in evaluating social systems, it is difficult or impossible to understand a system without considering its history, as well as its social and political context (Bellamy *et al.* 1999; Berkes *et al*. 2003). Thus, complex systems can best be understood by the use of a multiplicity of perspectives (eg. social, economic, environmental, political and technological) that recognise the fundamental importance of context.

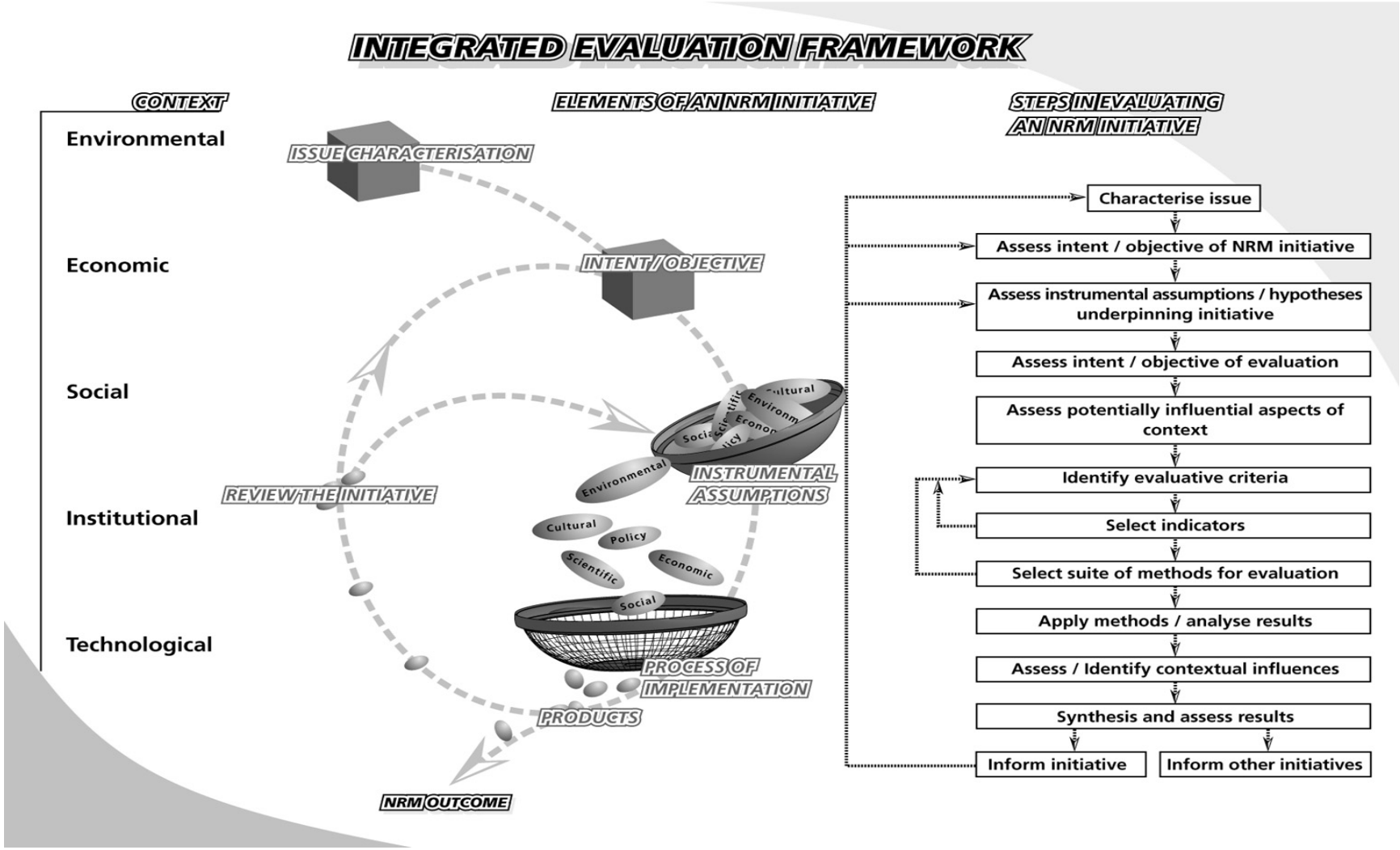
The monitoring and evaluation of natural resource management policy and planning therefore needs to be addressed as a system that (Bellamy *et al.* 2001):

(a) Links objective to consequence or outcome;
(b) Considers the fundamental implementation assumptions and instrumental hypotheses that underpin core policy or program objectives;
(c) Is grounded in the natural resource, policy/institutional, economic, socio-cultural and technological contexts of implementation in practice;
(d) Establishes practical, valid and equitable evaluation criteria by which change can be monitored and assessed;
(e) Involves methodological pluralism (including both quantitative and qualitative methods) to ensure rigour and comprehensiveness in assessment; and
(f) Integrates different disciplinary perspectives (i.e. social, economic, environmental, policy and technological).

Furthermore, evaluation must allow for the assessment of *impact* (i.e. environmental, economic, social, institutional, and technological) and be implemented as a *process tool* that (Bellamy *et al.* 2001):

- Supports purposeful and informative stakeholder participation;

Figure 2. A systems-based evaluation framework (adapted from Bellamy *et al*. 2001)



- Creates improved opportunities for the incorporation of on-going learning processes at individual, organisational and policy levels;
- Facilitates negotiation and mediation processes; and
- Supports the move towards better outcomes and the amelioration, or improvement in the manageability, of problems.

Figure 2 presents a systems-based evaluation framework that incorporates these principles and also recognises the multiple levels and nested nature of NRM policy, namely: problem characterisation, policy formulation and intent, program logic, and on-ground implementation. It also provides a logical structure and a set of steps for the evaluation. It is this way that the framework is systems-based and different from conventional methodologies. The systems view encourages critical reflection on policy implementation and a learning organisation approach involving continual and iterative policy improvement (e.g. Senge 1992).

This systems based evaluation approach has been tested and applied in a number of NRM policy and planning contexts (e.g. see Bellamy *et al.* 2001; Bellamy and Dale 2000). It provides an analytical framework for evaluating regional NRM policy and planning systems from multiple perspectives (see Fig. 1).

Key Lessons

1. The regional natural resource management policy environment can be described as numerous 'nested' planning activities being carried out concurrently across a range of functional scales (eg. federal, state, region, local) and across a number of different dimensions (eg. social, economic, environmental, institutional). Collectively this complex system of activities comprises the region's policy and planning system. The long-term sustainability of regions depends on the functionality and health of this overall system of regional policy and planning.

2. Evaluation and monitoring is central to the new breed of adaptive approaches to regional natural resource management policy and planning. Evaluation is fundamental to identifying change, supporting an adaptive approach that is flexible enough to meet the challenge of change, and enabling learning at community, institutional and policy levels. However, the new policy approaches challenge conventional thinking about success and failure and effectiveness and require a new approach to evaluation.

3. There is no one 'correct' or all encompassing level to evaluate a regional natural resource management policy and planning system. We need to look at the whole regional policy and planning system and undertake monitoring and evaluation through a multiplicity of different lenses. A lens might be a functional scale/level (e.g. federal, state, regional, or local implementation) or a thematic or sectoral view (e.g. protected areas, indigenous management, investment priority, water resource planning, biodiversity etc).

References

Bellamy, J.A. and Dale, A.P.. 2000. Evaluation of the Central Highlands Regional Resource Use Planning Project: A synthesis of findings. Final Report to LWRRDC, Project CTC13. CSIRO Sustainable Ecosystems, Brisbane, November 2000. http://irum.sl.csiro.au/

Bellamy, J.A., McDonald, G.T., Syme, G.J. and Butterworth, J.E. 1999. Evaluating integrated resource management. *Society and Natural Resources*, 12, 337-353.

Bellamy, J.A., Walker, D.H., McDonald, G.T. and Syme, G. J. 2001. A systems approach to the evaluation of natural resource management initiatives. *Journal of Environmental Management* 63(4), 407-423.

Bellamy, J., Ross, H., Ewing, S. and Meppem, T. 2002. *Integrated Catchment Management: Learning from the Australian Experience for the Murray-Darling Basin. Final Report. January 2002.* A Report for theMDBC. CSIRO Sustainable Ecosystems: Brisbane. http://www.mdbc.gov.au/naturalresources/icm/icm_aus_x_overview.html

Berkes, F., Colding, J. and Folke, C. 2003. Introduction. In: Berkes, F., Colding, J. and Folke, C (eds). *Navigating Social-Ecological Systems. Building resistence for complexity and change*. Cambridge University Press: UK, pp. 1-29.

Born, S. M. and Genskow, K.D. 1999. *Exploring the "Watershed Approach" – Critical dimensions of state-local partnerships.* Extension Report 99-1. Department of Urban and Regional Planning, University of Madison: Madison.

Bressers, H.T. and Kuks, S.M.M. 2003. What does "governance" mean? From conception to elaboration. In: H A. Bressers and W.A. Rosenbaum (eds). *Achieving Sustainable Development*. Praeger: Westport, Conneticut, pp. 65-88.

Chelimsky, E. 1997. The coming transformations in evaluation. In: E.S. Chelimsky and W.R. Shadish (eds) *Evaluation for the 21st Century. A Handbook*. Sage Publications: Thousand Oaks California, pp. 1-26.

Dovers, S. and Wild River, S. (eds) 2003. *Managing Australia's Environment.* The Federation Press: Sydney.

Gibson, C., Ostrom, E. and Toh-Kyeong Ahn 1998. Scaling issues in the social sciences. International Human Dimensions Programme on Global Environmental Change (IHDP) Working Paper No. 1. May 1998. www.ihdp.uni-bonn.de/ihdp

Gunderson, L.H. and Holling, C.S. (eds) 2002. *Panarchy: Understanding Transformations in Human and Natural Systems.* Island Press: Washington

Gunderson, L.H., Holling, C.S. and Light, S.S. (1995). *Barriers and Bridges to the Renewal of Ecosystems and Institutions.* New York: Columbia University Press.

Innes, J.E. and Booher, D.E.1999. Consensus building and complex adaptive systems. A framework for evaluating collaborative planning. *Journal of the American Planning Association* 65 (4), 412-423.

Lee, K.N. 1993. *Compass and Gyroscope: Integrating Science and Politics for the Environment*. Island Press: Washington, DC.

Standing Committee on Agriculture and Resource Management (SCARM). 1999. Managing Natural Resources in Australia for a Sustainable Future. A discussion paper for developing a national policy. December 1999. Agriculture, Fisheries and Forestry – Australia (AFFA).

Senge, P.M. 1992. *The Fifth Dimension: The art and practice of the learning organisation*. Milsons Point, N.S.W.: Random House Australia.

Wondolleck, J.M. and Yaffee, S.L. (2000). *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*. Island Press: Washington, D.C.

3. Evaluating regional resource management plans[3]

Geoff McDonald[1], Bruce Taylor[1], Clive McAlpine[2] and Adele Vagg[3]

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Introduction

This paper briefly discusses the concepts, methods, results and experiences gained from on-going plan evaluation research on regional natural resource planning in Northern Australia (McDonald *et al*. 2003)

Given the prominence of planning and plans in natural resource management, it seems obvious that we need to understand where plans fit into the policy system, how effective they are, and what contribution they make. To understand whether a policy system is working well or not, and why, requires consideration of many political, legal, bureaucratic, financial and procedural dimensions of the system in which plans are just one element. Plans translate policy objectives into a range of actions including statutory, economic and program funding actions on the ground.

For regional natural resource management, "the regional resource management plan" is a composite of a whole raft of plans at scales from national to local. Plans could be evaluated singly or as an aggregate. Occasionally, there is a defined subsidiarity relationship between plans, such as those linking national or state conservation priorities into local planning and approval systems, or regional local government plans into state growth management programs. More often, the set of plans is disjointed, uncoordinated and even contradictory.

The research reported here is one component of a larger program evaluating all aspects of regional natural resource management, including context, processes and outcomes. We acknowledge the difficulty of isolating the technical and process dimensions of planning – "The best laid plans of mice and men go oft astray" (Dante). Despite that risk, and the close connection between plans and decision-making processes, we believe there is value in exploring the strengths and weaknesses, and actual or potential effectiveness of the technical aspects of plans alone.

Plan Evaluation

Research on plans themselves, their substantive content and effectiveness is surprisingly uncommon. The substance of a plan evaluation depends on the purpose of the evaluation and when it occurs in the planning cycle along the Inputs-Process-Outputs-

[3] The authors acknowledge the support of the Savanna CRC Darwin for this research. This paper is based on the report for CRC Project 3.2.1 G.T. McDonald, C.A. McAlpine, B. M. Taylor & A. R. Vagg: 2003, *Criteria and Methods for Evaluating Regional Natural Resource Management Plans in Tropical Savanna Regions*.

Outcomes–Review continuum. In some cases the evaluation may fulfill the role of cyclic review of a plan; in other cases it may assist more radical reforms to a planning system. Our purpose here is to provide objective information from evaluation to assist on-going policy development and implementation.

Knaap and Kim (1998) categorise evaluations of environmental programs (and plans) into three:

- *Process evaluations* addressing program implementation;
- *Impact evaluations* addressing program outcomes; and
- *Efficiency evaluations* addressing program benefits and costs."

The Australian National Audit Office (1997) applies a standard framework for evaluating programs across all government sectors and defines four types of conventional evaluation:

- *Appropriateness evaluations* of the extent to which program objectives or desired outcomes align with government priorities and client needs;
- *Cost effectiveness evaluations* of the input cost (in money terms) of given outcomes which may not be readily expressed in money terms;
- *Effectiveness evaluations* measuring the extent to which project outcomes are achieving program objectives, and
- *Efficiency evaluations* which focus on the extent to which program inputs are minimised for a given level of program outputs, or the extent to which outputs are maximised for a given level of inputs.

In these terms, the work reported here reviewing published plans, falls into the category of appropriateness evaluation using externally derived "policy criteria" with view to assessing their potential impacts.

Some good published examples of plan evaluations include:

- *New Zealand Regional Policy Statements* (RPS) assessment: The New Zealand *Resource Management Act* requires that the suitability and effectiveness of the RPS be monitored every five years to determine whether the plan has achieved the anticipated environmental outcomes. Examples of this type of evaluation include Wellington Regional Council (1995) and Canterbury Regional Council (1998). The methodology is based on measuring quantifiable indicators of plan outcomes. See also Grundy(2001) and Hutchins (1995).
- *Local land use plans in England:* The UK Home Office evaluated local land use plans, focusing on the outcomes of these plans and especially whether or not they were meeting economic development and environmental needs and whether the plans had the effects intended (PIEDA 1992). This *ex post* evaluation of planning instruments used an "adapted balance sheet" approach to evaluate the components of the plans.
- *Patsy Healey* has conducted considerable work assessing the British and European Planning systems. She adopts an institutionalist approach, "focussing on the instruments or tools of the system; the institutional arrangements and practices which have been built up in putting the system into operation, and the ideology or body of ideas which frames how participants think about what the

system should do and how it should operate." (Healey 1988: 403.). Her approach is more discursive.

- *Regional Planning in the United States:* Berke and Conroy apply plan evaluation techniques to local plans to answer the question: Are we planning for sustainable development? Do plans achieve balance by supporting all sustainability principles, or do plans narrowly promote some principles more than others? They develop a diagnostic methodology for answering these questions. (Berke and Conroy 2000; Conroy and Berke 2004). Using similar rating techniques Brody (2003) evaluates the degree of incorporation of ecosystem management principles into planning in Florida.

Implicitly or explicitly, these evaluation projects revolve around two dimensions and criteria for their measurement:

(i) *Ends* - what the plans should be trying to achieve. Ends are either defined in the plans themselves for monitoring and review, or externally defined ideals "meta-goals" or best practices against which local cases can be profitably assessed. (e.g. principles of equity, or sustainable development), and

(ii) *Means* - the availability and choice of information, strategies and instruments to achieve the ends. The technical components of a plan can be prescribed in broad terms. For example, better information produces better outcomes.

The Plan Evaluation Framework

The core question here is how can we evaluate a regional plan with respect to the criteria of sustainable development? We are concerned only with the plans themselves – most importantly we are not specifically evaluating the planning *process* or the *outcomes* of the plans – only, do the plans, in a formal structural sense, have the necessary ingredients to address rigorously the needs of sustainable development at the regional scale. The framework proposed for the evaluation of regional plans incorporates several elements, namely:

1. *Social, economic and biophysical criteria of savanna health* at the region or landscape scale (see Table 2). These criteria were derived from an understanding of both core threats and issues for tropical savannas regions and an adaptation of critical savanna health indicators developed for monitoring condition and trend in these landscapes and other relevant national and international monitoring frameworks.

   The main biophysical frameworks reviewed in this project included Australian and New Zealand Environmental Council (ANZECC)- Core Environment Indicators for State of Environment (SoE) reporting, National Land and Water Resources Audit Biodiversity Monitoring Report. (Whitehead *et al.* 2001). In particular, Tropical Savannas CRC Savanna Health Indicators. Indicators of landscape function, landscape structure, pasture condition and components of biological diversity provided criteria that could be practically applied to measure and monitor savanna health (Whitehead *et al.* 2000). See also (McDonald *et al*. 2003).

   The main socio-economic concepts considered here included *Organisation for Economic Co-operation and Development* (OECD 2001) national scale social

indicator framework (self-sufficiency, equity and social cohesion) and the working concept or definition of a '*healthy savanna landscape'* which includes, that it 'reliably meets the long term needs (spiritual, aesthetic and material) of those with an interest in the savannas' (Whitehead *et al*. 2000).

2. *Plan-making components***.** The important plan 'parts' which represent and document the critical planning steps or mechanics of the plan. These plan component criteria have been derived from key EMS ISO14001 components as well as the recognised more rationalist models of planning such as those being currently presented through the emerging regional approaches in the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust. (International Standards Organisation 1995)

3. *An assessment of the quality of the information* incorporated into the planning process with respect to the savanna heath criteria (1) and its application in the key plan components (2) using a descriptive five point rating scale.

4. *Whole-of-region planning output.* Where useful, plans were evaluated as part of their respective regional suite of planning. An overall assessment of regional planning output (in terms of planning documentation) was made in the form of regionally based reports, highlighting the regional strengths, duplication or deficiencies across the body of planning in that region. From here comparisons within and between regions and jurisdictions was undertaken providing a basis for sharing key lessons between planners.

In simplest terms the framework comprises an evaluation matrix incorporating the first three components listed above, as shown in Table 1. The matrix seeks to integrate the above considerations by asking, "*To what degree are desired outcomes (savanna health criteria) reflected in the major plan-making components, and, what is the quality of information or knowledge being used in these steps?*"

Table 1: Simplified conceptual model of the plan evaluation framework.

Example Plan (A)		**Desired Outcomes for Sustainable NRM (Savanna Health Criteria)**															
		Society, economy and institutions			Biodiversity			Soil and pasture health			Catchment and river health			Carbon			
Plan Components	Information																
	Objectives & Targets																
	Options																
	Priorities																
	Implementation																
	Monitoring & review																

Rating 'score' for comprehensiveness of information applied

Table 2 presents the outcomes-based plan evaluation criteria for application in the 2004-05-review phase. These were revised following an evaluation of their effectiveness in the 2002-03 review phase.

Table 2. Plan evaluation criteria for desired regional planning outcomes.

Social & economic outcomes	1. Population, employment and service provision supporting healthy savanna towns and communities
	2. Physical infrastructure is appropriate for savanna communities & environments
	3. Indigenous values (including cultural heritage) are recognised and protected
	4. Non-indigenous cultural heritage and landscape values are recognised and protected
	5. Costs and benefits of resource management shared equitably
	6. Economic viability of enterprises and industries is improved
Capacity outcomes	7. Inclusive participation and active involvement in groups and networks is maintained
	8. On-going learning, skills development and training is supported
	9. Access to and use of technical information is improved
	10. Regions are able to respond positively to external change pressures and internal variability
	11. Institutions are aligned for regional sustainability
Catchment & River Health outcomes	12. Soil and water salinity levels are maintained or improved
	13. Water quality in freshwater streams and lakes is maintained or improved
	14. Environmental flow requirements of streams maintained
	15. Groundwater levels and quality is maintained or restored
Estuary & coastal outcomes	16. Water quality in estuarine and marine waters is maintained or improved
	17. Downstream impacts (connectivity) considered
	18. Impacts on physical coastal processes are managed
Carbon & energy outcomes	19. Regional net carbon emissions are minimised
Biodiversity outcomes	20. Landscape structure and complexity are maintained
	21. Ecosystem diversity is maintained
	22. Species diversity is maintained
	23. Ecosystem integrity is maintained
Soil & Pasture Health outcomes	24. Soil condition and health maintained

Applying the framework

The criteria were applied to plans in the regions of Fitzroy Basin, Burdekin, Cape York, Northern Gulf, Desert Uplands, Lake Eyre Basin, Kimberly and Northern Territory. The types of plans reviewed included: Community-developed NRM strategies, regional growth management frameworks; economic development plans; and, statutory resource management and allocation plans. The methodology of data collection was largely the desktop review of planning documents and consultations involving 'ground-truthing' the findings with regional planners. Evidence gathered in this way may overlook important, but only implicit, links to information sources. Similarly informal aspects of plan implementation are often not obviously apparent in the written plans if not known by our informants.

Table 3 presents example results of the reviews organised by plan components. The database is a matrix, and results could be similarly presented for selected sustainability outcome criteria, for example biodiversity or indigenous natural and cultural resources.

Table 3. Example results from the 2002/03 reviews of savanna plans

Plan component	Some examples of findings
Gaps in substantive coverage and information base	• Indigenous values and indigenous cultural heritage • Groundwater • Social and economic impacts of resource decisions • Pasture condition and health • Soil and water salinity issues • Responding to external pressures
Goals. objectives and targets	• Broad goals but qualitative objective statements; • Low application of the information base to developing clear spatially and temporally defined objectives (targets) • Plans summarise regional information to the point where the source of a key problem statement is no longer traceable; • High reliance on local technical knowledge to supplement the available data for planning (community-based plans);
Priorities and options	• Most community-based and statutory resource plans document the process used to prioritise issues or strategies, linking this with key investment planning. • Objective analysis of options using tools such as cost-benefit analysis, other effectiveness measures or impact assessment was largely absent. • Often in community-based plans the most highly prioritised resource problems had the lowest information levels.
Implementation approaches	• Where sub regional approaches were taken (also in some RGMFs) this greatly improved the clarity of directions for implementation • Many plans took an issue-by-issue approach increasing the risk of duplicating or missing integrated solutions.
Monitoring and reporting	• Most plans recognize the need for effective monitoring approaches however no plan reviewed presented a consolidated monitoring and reporting proposal or set of agreed indicators

Discussion

Direct or immediate benefits of applying the framework as an evaluation tool include supporting an evaluation of 'functional' parts of plans (e.g. targets, monitoring frameworks etc.). Importantly the component-based aspect of the review includes a general assessment of the effectiveness or otherwise of those functional parts of the plan. The reviewer is able to state (with caution) how adequately, for example, regional priorities are identified in the plan and how clearly the process used to establish these is evident. Similarly the reviewer can also evaluate key content areas, regional outcomes or planning 'issues'; and, importantly provide a combined "issue-function" analysis. For example, how rigorously is pasture condition covered in the set of plans?

Indirect benefits and other beneficial applications of the framework include that it can be used in a formative way by planners in developing and reviewing plans. The framework can also be used as a 'broader-than-program' review framework, e.g. programmatic requirements can 'nest' within the framework of broader regional outcomes (Criteria). It also provides the opportunity to undertake a comparative analysis between plans, between types of plans or between regional suites of plans. One recent application has also included scoping and mapping strategic or complimentary relationships between plans using the framework.

Comparing plans between regions created some difficulties. In particular, the variation in *planning stage and context* between regions resulted in widely varying levels of maturity in planning. Similarly, the scope of different types of regional plans reviewed raised issues for applying a single set of criteria and for aggregating those individual evaluations to account for interaction of plans or regional 'effect'.

The quantity of work involved made it necessary to have a team of reviewers, which created inherent variation of interpretation due to personal and inter-disciplinary biases. The review team sought to minimise the impact of these issues by producing explicit criteria were co-developed and agreed between all reviewers, and included supporting 'application notes' for each of the criteria[4]. Early involvement of planners in the design phase of the project, and subsequently through negotiating reporting frameworks or products for individual regions assisted verify the findings.

References

Abel, N. and Ryan, S. (eds) 1996. Sustainable Habitation in the Rangelands: Proceedings of a Fenner Conference on the Environment, Canberra, 29–30 October, CSIRO.

Australian National Audit Office (ANAO) 1997. *Commonwealth Natural Resource Management and Environment Programs. Australia's Land, Water and Vegetation Resources,* The Auditor General. Performance Audit. Audit Report No. 36 1996-97. Canberra, AGPS.

Berke, P.R. and Conroy, M.M. 2000. Are we planning for sustainable development? An evaluation of 30 comprehensive plans. *Journal of the American Planning Association*, 66(1): 21–33.

Brody, S.D. 2003. Implementing the principles of ecosystem management through local land use planning. *Population and Environment* 24: 6.

[4] These were also communicated in a short guideline publication used by both the review team as a common reference document and as the basis for interaction and explanation of the framework to planners (see *Evaluating plans in Tropical Savanna Regions: A guide for planners and plan reviewers* January 2003)

Canterbury Regional Council 1998. *Canterbury Regional Council Policy Statement* www.ecan.govt.nz 15 Mar 2001

Conroy, M.M., and Berke, P.R. 2004. What makes a good sustainable development plan? An analysis of factors that influence principles of sustainable development. *Environment and Planning, A*, 36: 1381-1396

Dale, A. and Bellamy, J. 1998. *Regional Resource Use Planning in Rangelands: An Australian Review*. Occasional Paper 06/98, Occasional Paper Series, Land and Water Resources Research and Development Corporation, Canberra.

Grundy K., McAllley I. and Naude S. 2001. Environmental monitoring under the Resource Management Act. *Australian Planner* 38(2): 133-141.

Healey, P. 1988. *The British planning system and managing the urban environment. Town Planning Review* 59(4): 397-417

Hutchings J. 1995. Monitoring responsibilities under the RMA. *Planning Quarterly* 120: 5-9.

International Standards Organisation. 1995. Environmental Management Systems—General Guidelines on Principles, Systems and Reporting Techniques, ISO, Geneva.

Knaap, G.J., and Kim, T.J. 1998. *Environmental Program Evaluation A Primer.* Urbana: University of Illinois Press

McDonald, G.T., McAlpine, C.A., Taylor, B.M. and Vagg, A.R. 2003. *Criteria and Methods for Evaluating Regional Natural Resource Management Plans in Tropical Savanna Regions*. Savannas CRC Project 3.2.1, Darwin

Organisation for Economic Co-operation and Development. 2001. *Society at a Glance: OECD Social Indicators, Social Issues*. OECD: Paris, France.

PIEDA. 1992. Evaluating the Effectiveness of Land Use Planning. London HMSO Perspective, CSIRO, Australia.

Wellington Regional Councils 2001. Wellington Regional Policy Statement, 15 March 2001. www.wrc.govt.nz

Whitehead, P., Woinarski, J.C.Z., Fisher, A., Fensham, R. J. and Beggs, K. 2001. Developing an analytical framework for monitoring biodiversity in Australia's rangelands. A report to the National Land and Water Resources Audit by Tropical Savannas CRC, Darwin.

Whitehead, P., Woinarski, J.C.Z., Jacklyn, P.M., Fell D. and Williams D. 2000. Defining and measuring the health of savanna landscapes: A north Australian perspective. Tropical Savannas CRC: Darwin.

4. Regional NRM planning arrangements: Evaluating through the State lens

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Introduction

Regional NRM programs are embedded in the institutional complexity and political competition of federal/state relations. Whereas the national level of analysis would highlight overall program logic and accountability, the State level of analysis requires attention to more subtle inter-organisational issues among various public sector agencies and various community and industry groupings, whose relationships can only be understood if the analysis raises sensitive questions about intention, trust, power, leadership, civic participation, and cooperative alignment. The institutional context of evaluation tends to favour reliance on traditional issues such as information quality, legal compliance and financial accountability. However, incorporation of diverse ranges of information – social, economic, organisational and biophysical – is essential. Qualitative data, especially on stakeholder perspectives, is vital for developing appropriate measures of success or improvement, given the central importance of new forms of collaboration and the ongoing needs of adaptive management for the new NRM programs.

Background

There is a clear understanding among NRM researchers and practitioners that there has been a shift over the last 20 years towards a new regional paradigm for NRM planning and implementation in Australia (Bellamy *et al*. 2002; Dovers and Wild River 2003; Stewart and Jones 2003; Lane *et al*. 2004, Head and Ryan 2004). This shift has at least six dimensions:

- *Multi-stakeholder participation of NGOs*: inter-sectoral forums, taskforces and committees have been vital for engaging and mediating conflicting perspectives on goals, priorities and cost-effective interventions;
- *Engagement of land-managers*: recognition that effective NRM, including the adoption of new approaches and techniques at the enterprise level, requires assistance for local champions of good practice and practical support for self-organising groups including effective linkage with indigenous communities;
- *Spatial scale*: broad agreement on 'regions' (understood as biophysical catchments) as the framework for major exercises in research, planning, and prioritising; while recognising that much of the on-ground implementation is necessarily at the local and enterprise levels;
- *Information base*: significant mobilisation of biophysical and social sciences to inform decision-makers and stakeholders about the nature of problems and the likely impacts of intervention options; but there are many different and uneven levels of knowledge about issues and locations;
- *Monitoring and evaluation*: growing attention to processes for ongoing assessment of program outputs and outcomes, to allow continuous adjustments

and adaptive management, open discussion of matters for improvement and learning from experience;
- *Formalisation of regional NRM planning bodies*: the recent Bilateral Agreements require either the formal establishment or enhancement of regional bodies to undertake NRM consultation, planning, priority-setting and program implementation in their respective regions.

Investment in designing and delivering new and more effective approaches to NRM is a matter for both the private sector and the public sector. It is the public sector – at local, state and national levels – that provides the diverse regulatory frameworks within which economic and social activities occur. The business sector, with some notable exceptions, has generally been sceptical if not hostile about further regulation and has often been unwilling to change its practices unless there are positive financial incentives including subsidies and compensation. The community sector and general citizenry are variously volunteers, participants in consultation, or mute bystanders in formal processes that are not seen as accessible to them.

Government roles and objectives

Within the public sector, there has been a major re-focus in NRM investment along the above lines. Leadership for positive change has occurred at all three levels of government but especially through the two well-resourced levels. While the States have had most of the ongoing responsibilities for relevant policy and regulatory frameworks (planning, economic development, land administration, biodiversity protection, pollution control, water supply and quality, etc), the federal government has used its financial power (large programs of tied-grants) to buttress its political and legal power to negotiate national strategy frameworks for NRM. As in other policy domains, there is a significant history of federal/state mutual distrust.

In the process of the Commonwealth cajoling and co-opting the States into participating as 'partners' in federal programs, a serious but unrecognised blurring of motives and objectives can occur on the part of the States. For State leaders, political objectives (e.g. success in securing federal funds to supplement State funds) are likely to be just as important as intrinsic policy objectives (e.g. commitment to the stated goals of a national strategy and associated grants program). Moreover, programs that claim to promote NRM/ESD typically contain very broad objectives ('sustainability') that are subject to extensive interpretation and debate (Dovers and Wild Rivers 2003).

Participation by the States in a 'national' NRM program does not immediately override or resolve such ambiguities at the State level, but may provide more sites of debate and contestation. Hypothetically, a State jurisdiction that does not feel strong ownership of a federally-designed 'joint program' may decide that minimal changes from State-controlled 'business as usual' will be satisfactory; and this will allow many of the 'normal' rivalries among State-level agencies to continue unabated. Alternatively, another State jurisdiction may decide to pursue vigorously the possible synergies and re-alignments that arise from such national programs.

Complications at State level may be exacerbated when new federal programs establish innovative decision-making or governance arrangements (including new ways to directly fund community bodies and thus by-pass State agencies). Finally, it is unclear

around Australia to what extent the nine governments involved in the new NRM programs actually support a genuine *devolution* of decision-making responsibility to multi-stakeholder community-based bodies. Retention of ultimate control through funding controls and regulatory constraints places tight limits around the extent of devolution. Under all these circumstances, evaluation through the State lens is likely to be complex and sensitive because it may call into question the gap between rhetoric and reality.

Evaluation: audiences and purposes

There are many different purposes and types of evaluation and performance review (Chelimsky 1997; Behn 2003). The nature of the evaluation may therefore be quite different, depending on whether the primary purpose is (Bellamy *et al*. 2001: 412):

- improving program management;
- improving transparency and accountability;
- reducing risk and uncertainty;
- fostering learning;
- improving process.

At one end of the continuum is the traditional narrow concern with annual financial compliance and fraud control (e.g. auditing how monies are authorised and spent). This approach is rule-based and it values precision and predictability in the audited activities. It takes no cognisance of broader social and political contexts.

In recent years, especially at the federal level through the ANAO and in some States (but not in Queensland), this narrow audit approach has been greatly expanded to embrace performance auditing, including rigorous performance auditing of policy implementation and program administration. This form of program evaluation typically takes the stated objectives and key strategies of a program as given, and seeks to assess the effectiveness of program implementation in achieving the stated objectives. Much value is placed on analysing whether there are rigorous, logical and clear links between objectives, activities/outputs, and desired outcomes. Attention is also paid to the quality and precision of performance information (ANAO 2001). Program performance evaluation, if undertaken in a thorough way, may be quite costly and typically occurs in a review cycle every three to five years.

At the other end of the continuum, many informal processes for evaluation are available, e.g. stakeholder workshops and focus groups. The purpose here is to gather stakeholder perceptions about key matters such as the shape and direction of change, obstacles and risks, sources of conflict and cooperation, opportunities and prospects for improvement, equity and accessibility, and indicators of success or failure. Greater weight may be given to qualitative information, but both quantitative and qualitative measures are often used for complementary purposes in a comprehensive evaluation.

Given that 'programs' are owned, structured, directed and funded by governments, the evaluation of programs is normally the prerogative of governments. Governments can select a mix of methods by which to generate useful information for the evaluation of policy and program performance (Zammit *et al*. 2000). However, the affected industry groups, community associations and NGOs also have a large stake in the evaluation outcomes, and should have a major role in making suggestions for improvement and in commenting on proposals for change. Moreover, it is increasingly common for

community and business organisations to commission their own assessments, whether formal or informal. They may utilise a variety of mechanisms for gathering stakeholder views on program impacts, and for publicising those views where relevant. Wealthy organised interests also occasionally commission their own research reports to underpin their advocacy role in policy debates.

Towards a State framework for evaluation

Understanding complex governance arrangements is itself very challenging, and must take account of the power, information and objectives of many actors (Bressers and Kuks 2003). Planning – and all its complexities of information management, consultation, prioritising, decision-criteria, and assessment – involves steering a reasonable and defensible course between competing interests and perspectives. NRM planning, by its very nature, relies on multi-disciplinary information from diverse expert and stakeholder viewpoints.

The choice of an evaluation framework at State level *for State purposes* may be influenced by several factors including the political and policy contexts of the evaluation as well as technical considerations. The State will be influenced by the cost of the various options, availability of socio-economic and biophysical information, timelines and frequency of review, stakeholder anxieties, political and intergovernmental uncertainties, the history of key issues, and the 'formative' or 'mature' status of the program itself. To ensure that evaluation is not undertaken solely for narrow financial purposes, it is necessary for other stakeholders to communicate the case for broader perspectives.

Treasury Departments often tend to prefer hard quantitative data rather than perceptual and contextual information. Choosing the right balance is important. Decisions are also necessary about the *scope* or breadth of activities and programs to be included in the evaluation. For example, there is a big difference between State-level evaluation of a specific program for water quality, and State-level evaluation of the complete suite of NRM activities within a whole State that will involve many policy frameworks, agencies and issues. In a State where the relevant programs will not normally be subjected to a thorough performance audit within the ongoing forward work of the State's Audit agency, the government or a lead agency may wish to commission a specific evaluation through independent consultants.

In principle, the evaluation framework should be 'open' for stakeholder involvement and understanding, without which the collaborative design and adaptive management approach of the NRM programs is contradictory (Innes and Booher 1999, Dovers & Wild River 2003). The adaptive management approach suggests a 'continuous improvement' model, which requires ongoing and regular opportunities to gather, assess and reflect on program information, rather than just a series of major reviews every three to five years. Just as importantly, the evaluation framework will be inoperative unless responsibilities for ongoing collection of information are reliably assigned and resourced.

The State level is actually comprised of a 'roll-up' of regional and sub-regional information, with a light overlay of State-wide processes and regulatory requirements. Some elements of evaluation therefore need to be 'owned' at the local and regional

levels by the relevant governmental, industry and community stakeholders. NRM planning is embedded in multiple planning agendas and legislative schemas, often administered by different agencies. The new regional NRM approach is intended to overlay and transcend the existing regulatory and territorial silos. It is no easy task to interpret, reconcile and transcend the many existing and sometimes competitive planning and regulatory regimes – and all without undermining the political legitimacy and legal integrity of the regional bodies' own plans and priorities.

The new regional NRM programs have emerged amidst the policy context (and political rhetoric) of intergovernmental *collaboration*, government/community *partnerships* to address complex problems, and the creation of new regional bodies to undertake more systematic planning and program investment activities (Head and Ryan 2003). At the State level, taking collaboration and partnership seriously is a sensitive matter, for at least three reasons. Firstly, it highlights the challenge and difficulty of successfully implementing 'joined-up' government. This approach, much admired in theory, has encountered significant implementation difficulties, both within a particular jurisdiction (getting State agencies to work cohesively together) and in federal/State relations (getting the partners in the federation to sing in tune from the same song-book). Drawing attention to governmental conflicts and incoherence is dangerous territory for the evaluators. Secondly, policy and program 'partnerships' usually involve relations between organisations that are very unequal and that have divergent expectations. Partnerships between governmental and NGO players are likely to require careful definition of roles and expectations, to avoid early disappointment and cynicism.

Thirdly, partnership themes draw attention to long-term commitment – are the new program approaches likely to become stable and permanent features of regional NRM governance, or alternatively are they easily discarded as program fashions come and go? The first answer (i.e. stable planning horizons) implies a commitment to good collaborative practices and processes, which typically take years to build up on the basis of experience and a growing level of trust. Generally speaking, trust can only be constructed through the course of a successful collaborative process, and cannot be assumed to exist in advance as a secure starting-point for collaborative projects.

Despite all these difficulties, it can be argued that assessing the nature and quality of the collaborative and partnering behaviours and processes should be an important part of the evaluation (Innes and Booher 1999). Assessing the capacity of each of the participants to contribute effectively to 'partnerships' is important. In previous programs, such as catchment management and Landcare, the central importance of local enthusiasm and small-group cooperation was readily identified, together with the risk of volunteer 'burnout'. However, it is possible that the formalisation of regional bodies could risk losing touch with the local-level community groups and volunteers.

The new regional governance bodies are an institutional innovation that must be an important focus of research and evaluation (Head 2004). Many of their roles, responsibilities and accountabilities are specified in the bilateral agreements that underpin the new NRM programs. The capacity of the regional bodies to work with their stakeholders, produce robust NRM plans and investment priorities, and negotiate all the legal and policy requirements of three levels of government, are critical success factors for the new program approach. These new regional roles include effective liaison with communities, with planners and knowledge experts, and with public

agencies. Regional bodies are the designated vehicles through which effective and well-prioritised plans for 'on-ground' improvement may be generated. It is therefore appropriate to evaluate the extent to which these new roles, skills and accountabilities are being discharged by the regional governance bodies, while at the same time recognising that some of their challenges and constraints may be caused by *external* factors such as the decisions, processes and complexities of other levels of government. It would also be useful to test the widespread perception that the regional bodies are being asked to do too much too quickly with too few resources.

State Evaluation – an example

For all the reasons outlined above, the evaluation of regional NRM through the State lens is difficult and complex, assuming that the evaluation is intended to go beyond simple performance information checked against a list of stated activities. In the context of an adaptive management approach to program design and continuous improvement, evaluation needs to find ways of mapping and assessing collaborative institutional processes that are vital for delivering high quality outcomes.

The NRM program requirement for alignment and cooperation arises at the *interface between* the three institutional levels of government, and also *within* each level of the public sector. The key roles assigned to regional bodies can be undermined by many factors. Hence, attention needs to be paid to the capacities of these new organisational forms and processes, together with the degree of support they receive from governmental and other players. Regional NRM bodies and processes are intended, in some degree, to be 'community-based' processes rather than bureaucratic governmental processes. As such, they need long-term support by other powerful players, and the quality of supportive interaction should be a matter for assessment.

Governments, like other investors, are likely to be impatient for quick results rather than waiting for new processes to bear fruit, so their attention needs to be drawn to the organisational and motivational 'health' of the bodies and systems that can deliver those results. Programs in their early stages are unlikely to produce rapid final outcomes (e.g. improved water quality, biodiversity protection). Therefore some attention must be given to the 'enabling' capacities of the new arrangements: in terms of knowledge and monitoring, skills and leadership, linkage and communication, and ability to discern and respond rapidly to practical experience with environmental management techniques. There can be no enduring achievement of outcomes if the mechanisms are weak.

In the context of a devolved set of NRM regional bodies, a learning culture is important. Comparisons between regional bodies within a State, and comparisons with results emerging under somewhat different arrangements in other jurisdictions, can provide useful diagnostic information for further investigation and improvement. The reasons for under-performance need to be rapidly assessed and additional support provided. Useful innovations, both technical and managerial, need to be documented and disseminated. These successful examples need to be available to regional bodies and stakeholders as part of the participative and adaptive processes.

In a recent project to map and assess the new regional NRM programs in one State, the project team developed six relevant themes for evaluation, as shown with sixteen illustrative sub-sets in Table 1 below.

Table 1. Key dimensions for regional NRM evaluation[1].

Economic and financial performance
Efficiency
Cost effectiveness

Strategic policy
Ensuring focus on ultimate goals
Accountability
Appropriate balance of coordination & flexibility for regional variations
Maximising opportunities for cooperation

Capacity
Skills & resources match responsibilities
Regional Bodies can implement on-ground works

Decision-making processes
Productive relationships between players
Appropriate division of tasks
Integration of plans & processes
Participation and representation meets engagement standards

Information availability and use
Data availability & quality
Effective communication of data & knowledge
Effective use of knowledge to achieve outcomes
Outputs and outcomes
Improved resource use decision-making and management practices.

Lessons

The new NRM programs require 'formative' evaluation strategies to assist in strengthening their capacity to deliver future outcomes. These programs are evolving and adapting. Evaluation should be a learning experience that helps all stakeholders rethink and improve their plans and behaviours. For such programs, built on innovative collaborative models, it is clear that a mechanical approach to collecting and assessing performance information is of little value for program improvement, albeit the gathering of much of this information (e.g. compliance with program activities, monitoring of biophysical trends) may be of importance for various official purposes. Indeed, evaluation itself can be a useful spur to the collection of new forms of information, and to ensuring responsibility for ongoing monitoring. Evaluation at State level should take due account of political context, organisational competition, trust, and leadership capacity. These are generally sensitive issues, and require negotiating 'permission' to discuss such topics with consenting participants.

The State level highlights the importance of political context and inter-organisational issues which are both ambiguous and sensitive, since they open up questions about cooperative alignment, trust, power, leadership, and civic participation; as well as more

[1] The primary work on this evaluation matrix was undertaken by Jenny Bellamy, Charlie Zammit and Geoff Cockfield; the full research team included Geoff McDonald, Bob Miles and Brian Head

traditional issues such as ensuring clarity of objectives and responsibilities, information quality, legal compliance and financial accountability.

Qualitative data, especially the gathering and analysis of stakeholder perspectives, is vital for developing appropriate measures of success or improvement, given the central importance of new forms of collaboration and the ongoing needs of adaptive management. Social and economic impacts have seldom been mainstreamed in program evaluation, and should be given prominence for such a people-centred arena as participative natural resource management. The implications for managers and stakeholders need to be highlighted. Stakeholders have to make the new processes work, so they need to be involved in the ongoing work of further considering the purposes and the implications of evaluation.

References

ANAO. 2001. Performance Information for Commonwealth Financial Assistance under the Natural Heritage Trust. Australian National Audit Office: Canberra.

Behn, R.D. 2003. Why Measure Performance? *Public Administration Review* 63 (5): 586-606.

Bellamy, J., Walker, D.H., McDonald, G.T. and Syme, G.J. 2001. A Systems Approach to the Evaluation of Natural Resource Management Initiatives. *Journal of Environmental Management* 63(4), 407-423.

Bellamy, J., Ross, H., Ewing, S. and Meppem, T. 2002. *Integrated Catchment Management: Learning from the Australian Experience for the Murray-Darling Basin. Final Report*. CSIRO Sustainable Ecosystems: Brisbane. http://www.mdbc.gov.au/naturalresources/icm/icm_aus_x_overview.html

Bressers, H.T.A. and Kuks, S.M.M. 2003. What does 'Governance' mean? From Conception to Elaboration. In: H.T.A. Bressers and W.A.Rosenbaum (eds), *Achieving Sustainable Developmen*t. Praeger: Westport Connecticut, pp.65-88.

Chelimsky, E.S. 1997. The Coming Transformations in Evaluation. In: E.S.Chelimsky and W.R.Shadish (eds), *Evaluation for the 21st Century: A Handbook*. Sage Publications: Thousand Oaks California, pp.1-26.

Dovers, S. and Wild River, S. (eds) 2003. *Managing Australia's Environment*. Federation Press: Sydney.

Head, B.W. 2004. Participation or Co-Governance? Challenges for Regional Natural Resource Management. Paper for the ASSA workshop on Participation and Governance in Regional Development. RMIT: Hamilton.

Head, B.W. and Ryan, N. 2003. Working with Non-Government Organisations: A Sustainable Development Perspective. *Asian Journal of Public Administration* 25(1): 31-56.

Head, B.W. and Ryan, N. 2004. Can Co-Governance Work? *Society and Economy* 26 (2-3): 361-382.

Innes, J.E. and Booher, D.E. 1999. Consensus Building and Complex Adaptive Systems: A Framework for Evaluating Collaborative Planning. *Journal of the American Planning Association* 65 (4): 412-423.

Lane, M.D., McDonald, G.T. and Morrison, T.H. 2004. Decentralisation and Environmental Management in Australia. *Australian Geographical Studies* 42 (1): 103-115.

Stewart, J. and Jones, G. 2003. *Renegotiating the Environment: The Power of Politics*. Federation Press: Sydney.

Wondolleck, J.M. and Yaffee, S.L. 2000. *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*. Island Press: Washington DC.

Zammit, C.A., Cockfield, G. and Funnell, S. 2000. *An Outcomes-based Framework for Evaluating Natural Resource Management Policies and Programs*. Land & Water Australia, Social & Institutional Research Program: Canberra.

5. Regional natural resource management planning arrangements: Evaluating through the regional lens

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Introduction

Regional natural resource management (NRM) planning, involving government, community and industry, has become a key mechanism in Australia for sustainable regional development and resource management. Traditionally, regional NRM policy is delivered through a multitude of arrangements by both state and federal governments across three core policy fields: environment (e.g. natural resource management policy); economic (e.g. infrastructure and industry and employment policy) and social (e.g. integrated and accessible service delivery). Australian governments are now investing in new approaches grounded in the underlying assumptions of an emerging sustainability paradigm of change, adaptation and learning (e.g. Lee 1993). These new approaches emphasise the development of partnerships, strategic alliances and broader consultation between those with policy authority and those with significant stakes in decisions. Since the early 1990s, the multiplication of regional programs has seen a matching proliferation of regional institutional arrangements for NRM. A critical example is the recent succession of Australian Government NRM programs including the National Heritage Trust (NHT1 and NHT2) and the National Action Plan for Salinity and Water Quality or NAP (e.g. AFFA 2000). The NAP and the second phase of NHT involve attempts by Federal and State governments to create mechanisms for community-based NRM through the establishment of accredited regional NRM bodies. The primary purposes of these bodies are to guide NRM planning strategy and investment priorities, and to provide the mechanism for greater community-based NRM.

While promoted and legitimatised through rhetoric of decentralisation and public involvement within an integrated policy framework, institutional capacity for these new collaborative approaches however is often lacking (e.g. Gunderson *et al*. 1995; Bellamy *et al.* 1999a, 2002; Innes and Booher 1999, 2003). Moreover, their implementation has met some institutional resistance as exemplified, for example, by the lengthy negotiations over the development of federal-state bi-lateral agreements for NAP and NHT across the different Australian states. In practice, the emerging regional approaches are highly experimental and there is a perception of considerable pressure placed on regional bodies to perform. This situation provokes a vital research question about where the implementation of regional NRM planning is heading in terms of institutional arrangements, capacities and technical performance. In essence evaluation is needed as we lack an understanding of 'what works, what doesn't, and what needs to be done?'

These new initiatives are introduced into an existing regional planning system that comprises a complex set of nested arrangements, both 'horizontal' and 'vertical', between different actors (e.g. business/industry groups, community organisations,

government agencies and politicians) and between different spheres of government (local, state and federal). Importantly, for evaluation through the regional 'lens', it is fundamental to undertake the evaluation in the context of the whole regional policy system as illustrated in Figure 1.

We argue that improving regional NRM delivery, investment and collaborative processes requires systematic monitoring and evaluation as part of the change process. This paper examines some of the challenges of implementation of regional NRM planning arrangements through the regional 'lens' in diverse contexts. The overall goal is to have evaluation that informs the process of adaptive change for regional NRM policy and its implementation processes as well as assisting the process of achieving healthy regional planning systems. We also describe a *context-structure-process-outcome* framework for evaluating regional NRM planning and explore some of the issues arising in apply this framework.

Challenges of evaluation through a regional lens

Evaluating context, structure, process, and outcomes of regional NRM policy and planning through a regional 'lens' is a deceptively difficult challenge for a whole range of reasons including:

(a) *Diversity in regional situations***:** The implementation of regional NRM policy and related arrangements is inherently context sensitive and a wide range of environmental, economic, social, policy/institutional and technological factors will influence planning, process and impact. In any particular instance, the human association with the regional environment is embedded in established social networks and interactions, fundamental social values, institutional frameworks, historical problems, past experiences and established ways of doing things and it will continue to be shaped by them in the future (Born and Genskow 1999; Bellamy *et al*. 1999b). Evaluation in such contexts is extremely challenging as it is hard to point to 'best practice' since practices need to suit the systems they sit in (eg. Bellamy et al. 1999b, 2002; Innes and Booher 2003). Similarly, the actual success of structures, processes, and outcomes may be greatly affected by the context in which they operate. Hence, it is necessary to evaluate the structures and functioning of each NRM system in light of their unique contexts.

(b) *Evolving arrangements*: Regional NRM arrangements are an evolving system at all functional levels. Each state or even region is evolving in different ways, for different reasons, in varying contexts and at different rates. The varied regional contexts relate to a complex and pluralistic social, institutional and natural resource environment. The evaluation of structure, process and outcomes of regional NRM planning needs to recognise and take account of this evolving context of implementation.

(c) *Complexity of institutional arrangements*: In Australia, all three spheres of government (local, state and federal) have a significant interest in regional initiatives, but such initiatives have generally developed independently of each other (Bellamy *et al*. 2002, 2003), however, there has been more financial coordination between Federal and State governments with the advent of NAP and NHT2. Currently, there are approximately 250 pieces of legislation and policies dealing with NRM related matters across the country (P. Martin, pers comm.). In addition,

there is significant diversity across and within different states in emergent regional NRM arrangements, including the role of local governments. Not only does each level of government typically adopt its own approach but state and federal governments often continue to design and implement program-specific arrangements that differ in scale, style, resourcing and accountability standards within themselves (Bellamy *et al*. 2002, 2003). As a consequence, a diversity of regional NRM planning arrangements exists across Australia and within any state or region. These different arrangements for implementation may well have competing objectives and interests and developing an appropriate level of understanding of the situation is demanding.

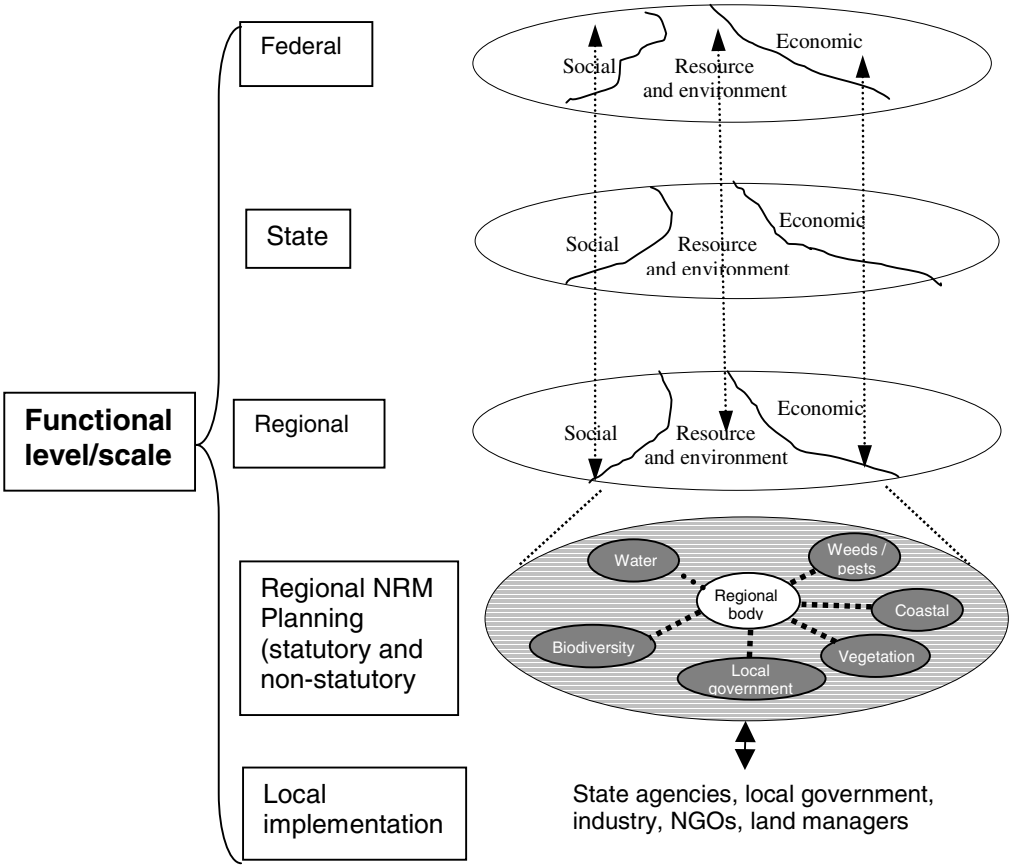


Figure 1: Evaluating the regional NRM planning system through a regional lens

(d) *The challenge of time*: Time is a critical issue in implementing regional NRM planning and often contentious. One of the greatest difficulties for the evaluation of regional NRM planning arrangements is that the critical outcomes are long term and cannot be readily measured. If the evaluation is to build trust through communicative and functional relationships with policy arenas and other relevant regional stakeholders as well as ultimately be a successful change agent, this will take time to work through thoroughly. Misalignment among stakeholder expectations and goals in relation to time is often a source of conflict (eg. pressure posed by the need for compliance with funding cycles; trust is unlikely to be present initially but is earned over time; the demand for short term tangible results in

processes focussed on long term strategic outcomes). Moreover there is often a drift in objectives and evolution of stakeholder expectations over time.

(e) *Conflicting purposes for evaluation*: The two most commonly recognised purposes for NRM evaluation are programmatic accountability and adaptive management (e.g. individual, organisational, policy). However, these two purposes may be in conflict as the audit function (including securing continuing funding) of a programmatic evaluation may not be conducive to supporting adaptive change processes. If the purpose of the evaluation is focussed on demonstrating accountability (e.g. in terms of return on investment and meeting agreed objectives), the evaluation may be an end in itself rather than a means to an end (e.g. through learning that leads to transformation of practice). It is essential therefore for an evaluation to be clear on its purpose and recognise, for example, whether it is an audit for accountability or an evaluation for learning to support adaptive management. Evaluation focussed on accountability can impede learning by motivating people to stick with the 'tried and true' rather than innovating and thereby taking on greater risks of failing to meet specified targets.

(f) *Building ownership of the evaluation*: Relationship building among evaluators and other stakeholders is a fundamental pre-requisite to ownership and ultimately commitment to change. Fostering ownership is a challenging task that requires time, resources and on-going and close attention. Importantly, evaluation should not be a linear process that views the regional NRM planning partnership activity solely in terms of success and failure. Rather evaluation needs to be a process that embraces the complexities and interrelationships between each level of influence involved through incorporating cycles of feedback, reflection and review to provide a mechanism for continuous learning and adaptation and two-way sharing of information. Conflicts of interest may arise at different times and at various levels as each partner or stakeholder has a particular perspective, timeframe and expectations about outcomes. In this context, ownership of an evaluation is essential for learning. The effectiveness of evaluation therefore requires institutional cultures that are conducive to learning. However, there is often a lack of positive culture for evaluation in agencies and other organisations, such that regional policy processes are not evaluated or the learnings from past experience are not "captured" into the way the organisation's business is done except at best in an *ad hoc* way.

(g) *Resistance within organisations to adopt change:* The cultures of organisations can limit implementation of initiatives aimed at operational and policy improvements. As part of the adaptive management cycle, evaluations may identify areas requiring change to improve future outcomes. However, organisations responsible for their implementation may be constrained in their adoption. In particular, agencies often have limited capacity to make major changes if these impact on their financial, policy or organisational environments. Another problem may a reluctance by senior decision makers to base decisions to change on what has been learned from previous evaluations, who may be too willing to change despite scant evidence that the chosen change will succeed.

A systems-based framework for evaluating regional NRM planning arrangements

We are currently developing and testing a *context-structure-process-outcome* framework for evaluating regional NRM planning arrangements looking through the regional lens. The initial testing of the framework is occurring through a Tropical Savannas CRC project, evaluating the development of regional planning arrangements across Queensland, northern Western Australia and the Northern Territory. The approach adapts a systems-based framework developed for evaluating NRM by Bellamy *et al.* (1999a; 2001) and a framework used to analyse ICM approaches across Australian states (Bellamy *et al.* 2002), which have several major antecedents (also see Bellamy and McDonald, this Symposium), including:

- Mazmanian-Sabatier (MS) model (Mazmanian and Sabatier 1981; Sabatier 1986) which has valuable structuring capabilities[5] but was found it to be deficient in addressing instrumental assumptions ("causal theory" in MS terms) and implementation processes (see Bellamy *et al*. 1999a, 1999b);
- The principles of the PRIME procedural model (Syme *et al*. 1994) which focused on management processes but needed better grounding in program context and structures;
- Crane's (1988) socially significant evaluation indices[6]; and
- The authors' collective experience with complex resource management programs, many of which were experimental, making conventional and often economic-based evaluation methodologies largely ineffective (e.g. McDonald 1989; Bellamy *et al.* 1999b, 2002, 2003; Bellamy and Dale 2000).

The framework has four core elements, which are identified in Figure 2 and briefly discussed below:

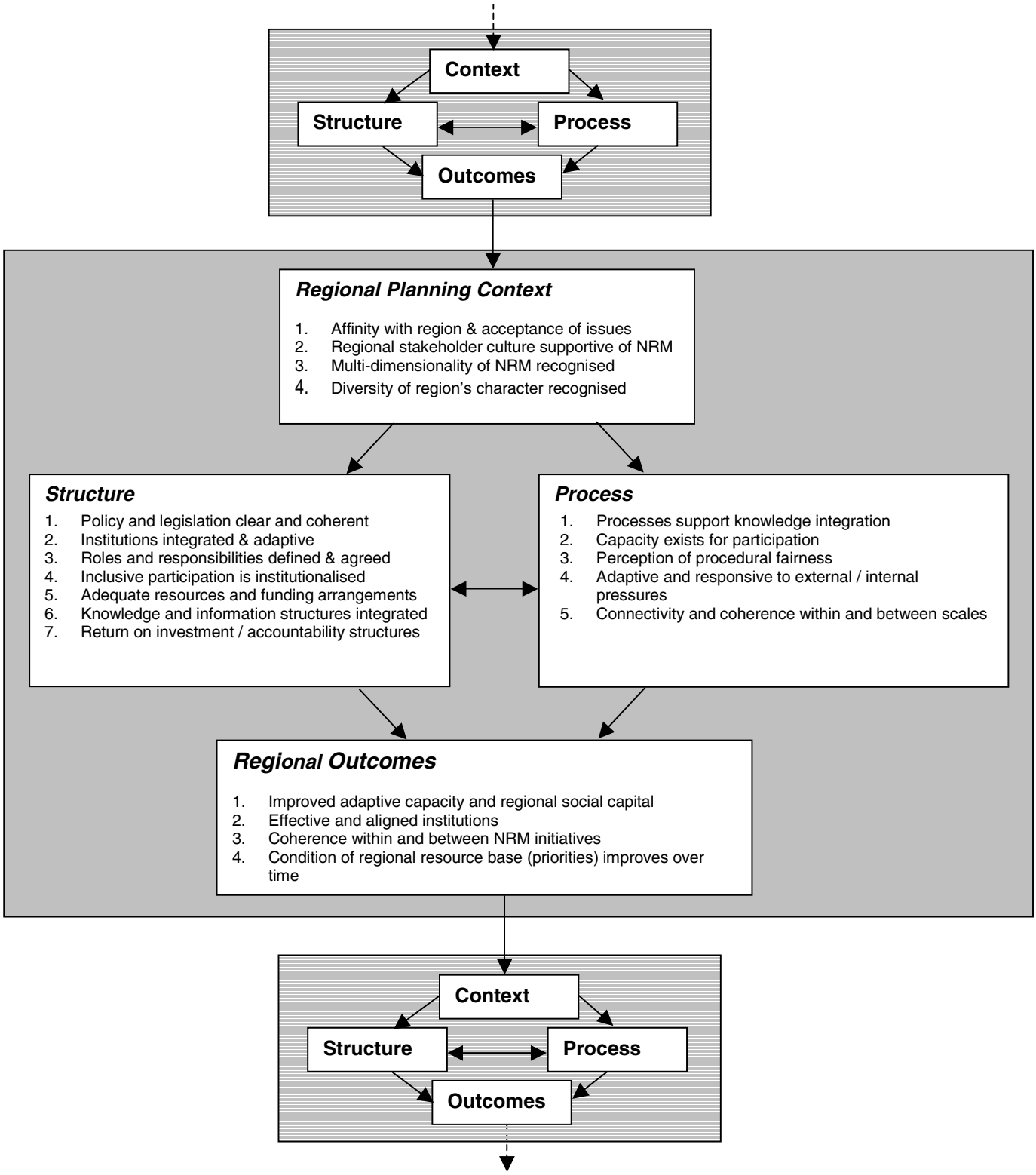
(a) *Context*: refers to the social, economic, environmental, institutional and technological factors that influence: the framing or characterisation of the problem; the rationality underlying the policy or regional response; the implementation processes; and on-ground performance. Regional NRM arrangements need to be flexible and adapted to the variability in resource use context across regions and to drive the community responses to natural resource management. This, in turn, will determine how natural resource problems are framed and ultimately the focus of on-ground collaborative activity.

(b) *Structure*: Regional NRM provides the potential vehicle for delivering inclusive, equitable and empowered community-government partnerships as a critical component of the broader governance arrangements. As such, *structure* refers to the rules, policy mechanisms and formalised institutional relationships for regional NRM planning relating to the region at all levels (eg. local, regional, state, federal).

[5] In seeking to explain variation in implementation success across programs and organisations, Mazmanian and Sabatier (1981) identified three sets of independent variables relating to: the tractability of the problem(s) being addressed by the statute; the ability of the statute to favourably structure the implementation process; and the net effect of a variety of non-statutory variables on the balance of support for the statutory objectives.

[6] Crane (1988) identified a set of five assessment criteria for the evaluation of social policies which are equally relevant to natural resources program evaluation: inclusiveness; adequacy; equitableness; effectiveness/efficiency; and democratic involvement

Figure 2: Analytical framework for evaluating evolving regional planning arrangements



(c) *Process*: NRM relies on widespread recognition that resource use actions will have implications across a region or catchment, and a social climate that values the region/catchment as a 'common property' for which all stakeholders are mutually responsible. As such, process refers to the activities, strategies, operations and actual relationships that define and influence the functionality of a regional NRM planning system and determine its impact and outcomes. These provide the

implementation process for the various planning frameworks and in effect the 'vehicles' through which regional NRM is delivered.

(d) *Outcomes*: NRM policy arrangements, processes and practices aim to contribute substantially towards achieving sustainable and equitable resource use and management outcomes at the regional level and incorporate social, economic, environmental and institutional outcomes. As such outcomes refers to the outputs or deliverables produced as well as the impacts that are achieved, both anticipated and unanticipated, by the regional NRM planning system.

This *context-structure-process-outcome* framework provides the basis for assessing the 'health' of the regional NRM planning system in terms of effectiveness of structures, processes and outcomes and identifying clear directions for areas needing improvement. In this way, the *context-structure-process-outcome* framework provides a diagnostic tool to critically assess the functionality system components. For example, the functionality of the structures of a particular planning system may be dependent on both the context in which they are set-up and also the way that they are implemented in practice. Furthermore, the *context-structure-process-outcome* framework allows evaluation over various iterations of the planning system (in a temporal sense), whereby the evaluation of one planning system iteration informs the context of the subsequent evaluation – this is of course made more complex by multiple timescales operating within and between planning system iterations (e.g. between and within NAP and NHT2)

Lessons

1. The diverse nature and complexity of regional arrangements in practice at the regional level requires a systems approach to evaluation that encompasses the four dimensions of NRM (i.e. context, structure, process and outcomes) distinguished in our evaluation framework, and recognises their evolutionary nature.

2. In evaluating through the regional lens, maximising understanding of the regional NRM planning system will come from evaluating how the primary institution/organisation of interest is situated in context. That is, instead of focusing an evaluation on one institution alone (e.g. a Regional NRM Body) and how it is performing, evaluation also needs to focus on how that institution fits into the overall system of regional planning and in particular its functional relationships with other elements of the NRM planning system.

3. There is potential for conflict between programmatic evaluation for accountability and evaluation for adaptive management for both policy/program implementation and on-ground actions (e.g. that improve resource condition, regional capacity for NRM, or stakeholder engagement processes). To overcome this, clarity of evaluation function and shared understanding between participants, clients and the evaluation team are critical.

4. Ownership of the evaluation by key stakeholders of regional NRM is needed to enable any learnings from the evaluation process to move beyond being just feedback to enabling/facilitating change through adaptive management responses. This requires a formative approach to evaluation to ensure there is a clear and communicative link to policy, planning and delivery processes for regional NRM.

References

Agriculture, Forests and Fisheries Australia (AFFA) 2000. Our Vital Resources: National Action Plan for Salinity and Water Quality in Australia. October 2000.

Bellamy, J.A. and Dale, A.P. 2000. *Evaluation of the Central Highlands Regional Resource Use Planning Project: A synthesis of findings.* Final Report to LWRRDC, Project CTC13. CSIRO Sustainable Ecosystems, Brisbane, November 2000. http://irum.sl.csiro.au/

Bellamy, J. and McDonald, G. (this Symposium). Through multi-scaled lenses: A systems approach to evaluating natural resource management policy and planning.

Bellamy, J.A., McDonald, G.T., Syme, G.J. and Butterworth, J.E. 1999a. Evaluating integrated resource management. *Society and Natural Resources* 12: 337-353.

Bellamy, J.A., McDonald, G.T, Syme, G.J. and Walker, D.A. 1999b. Planning and implementing Integrated Catchment Management. Volume 1, pp229-250 in: *Evaluation of Integrated Catchment Management in a Wet Tropical Environment: Collected Papers of LWRRDC R&D Project CTC7*. CSIRO Tropical Agriculture: Brisbane. http://irum.sl.csiro.au/icm/

Bellamy, J.A., Walker, D.H., McDonald, G.T. and Syme, G. J 2001. A systems approach to the evaluation of natural resource management initiatives. *Journal of Environmental Management* 63(4): 407-423.

Bellamy, J., Ross, H., Ewing, S. and Meppem, T. 2002. *Integrated Catchment Management: Learning from the Australian Experience for the Murray-Darling Basin. Final Report*. January 2002. A Report for theMDBC. CSIRO Sustainable Ecosystems: Brisbane. http://www.mdbc.gov.au/naturalresources/icm/icm_aus_x_overview.html

Bellamy, J., Meppem, T, Gorddard, R and Dawson, S. 2003a. The changing face of regional governance for economic development: Implications for Local Government. *Sustaining Region*s 2 (3) Winter 2003: 7-17.

Bellamy, J., G. McDonald and A. J. Brown 2003b. The Future of Australian Regional Governance: Ideas for a national interdisciplinary collaborative research program on regional governance frameworks. CSIRO/Griffith University, unpublished.

Born, S. M. and Genskow, K.D. 1999. *Exploring the "Watershed Approach" – Critical dimensions of state-local partnerships*. Extension Report 99-1. Department of Urban and Regional Planning, University of Madison: Madison.

Crane, J.A. 1988. Evaluation as scientific research. *Evaluation Review* 12 (5): 467-482.

Gunderson, L.H., Holling, C.S. and Light, S.S. (1995). *Barriers and Bridges to the Renewal of Ecosystems and Institutions*. New York: Columbia University Press.

Innes, J.E. and Booher, D.E.1999. Consensus building and complex adaptive systems. A framework for evaluating collaborative planning. *Journal of the American Planning Association* 65 (4): 412-423.

Innes, J.E. and Booher, D.E. 2003. *The impact of collaborative planning on governance capacity*. Working Paper 2003-03. Institute of Urban and Regional Development, University of California, Berkeley.

Lee, K.N. 1993. *Compass and Gyroscope: Integrating Science and Politics for the Environment*. Island Press: Washington, DC.

McDonald, G.T. 1989, 'Rural resource land use planning decisions by bargaining'. *Journal of Rural Studies* 5(4): 325–35.

Mazmanian , D.A. and P.A. Sabatier. 1981. The implementation of public policy: A framework for analysis. In: *Effective Policy Implementation*, eds. D.A. Mazmanian and P.A. Sabatier. Toronto: Lexington Books, pp. 3-35.

Sabatier, P.A. 1986. Top-down and bottom-up approaches to implementation research: a critical analysis and suggested synthesis. *Journal of Public Policy* 6 (1): 21-48.

Syme, G.J., Butterworth, J.E. & Nancarrow, B.E. 1994. *National Whole Catchment Management: A Review and Analysis of Process.* LWRRDC Occasional Paper Series No. 01/94. LWRRDC, Canberra.

6. The value of evaluation through the local implementation lens

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Introduction

Across Australia, Federal, State and Territory governments are engaged in a collaborative visionary approach to environmental and natural resource management (NRM), which relies on devolved regional NRM delivery based on long-term community-owned plans. A key component to the human and environmental effectiveness of such partnerships is a program and performance monitoring and evaluation system tied to natural resource condition, which seeks to identify and incorporate improvement opportunities. The challenge is to ensure that such a program and performance monitoring and evaluation system delivers benefits to all and does not degenerate into a perfunctory performance audit.

A central tenet for the evaluation profession has always been the utility of evaluation findings, satisfying the information needs of those commissioning the research. Yet at one point in recent history, despite an exponential growth in number and diversity of evaluations, it became clear discovered that evaluation recommendations -- intended to progressively improve the quality of decision-making -- were rarely being formally acted upon. The subsequent flurry of research inquiry successively re-cast the research focus from *utilisation*, to *use* and finally to the *influence* of evaluation. This focus has resulted in greater scrutiny on understanding the dimensions of influence of evaluation and evaluation research.

Over the past decade there has been an increased recognition and acceptance of the *process values* arising from evaluations as being not just an artifact of evaluation but rather of equal or even greater significance than the traditional data-based value of evaluation findings. This conceptual shift has accompanied the growth in participatory evaluation and action research that in some ways directly challenges traditional social science research methodological precepts of non-intervention and impartiality. Yet increasingly the experience of engaging in the evaluation process is seen to provide critical process benefits for learning organisations and learning societies in embracing change through a continuous improvement process.

This paper uses examples from state-wide investment programs funded under the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust supporting regional community-based NRM delivery in Queensland to argue that the dialogue surrounding the development of a monitoring and evaluation strategy has served as an empowering motivator which at the same time has delivered significant benefits by clarifying and "ground-truthing" linkages between values, goals and action.

Value of Evaluation

Traditionally the value of evaluation has been seen to reside in the utility (utilisation) of the findings, that is, the way conclusions and recommendations from evaluations satisfy the information needs of those who commission the research and the way that lessons learnt can be or are incorporated in subsequent phases of a project in order to provide better information for planning and decision making.

However, the reality was that, by some estimates, only a minor proportion of evaluation recommendations were ever acted upon (Cronbach and Associates 1980; Thoenig 2000).

Complaints by U.S. Congress members in the 1960s over the failure to formally utilise conclusions and recommendations of evaluation, i.e. the evaluation findings, stimulated researcher's efforts to further investigate in order to understand the factors contributing to rapidly increased levels of demand for evaluation. Clearly, even then there was an obvious momentum to undertake evaluation more extensively and to broaden its application to the investigation of a more diverse range of programs. It was obvious that "evaluation use [was] characterised by a growing recognition of its multiple attributes" (Kirkhart 2000:5). Yet it was not obvious exactly what it was that made evaluation useful.

Resulting inquiries identified three different uses/utilisations of results classified as *instrumental*, *conceptual* and *symbolic* (Leviton and Hughes 1981). Instrumental use refers to the direct application and translation of evaluation findings into action; conceptual use refers to the enlightenment or "cognitive impact on appreciation or understandings" (Rich 1997) which comes out of evaluation findings and recommendations but may not have direct application into action; and symbolic use refers to use of the findings in "advocacy, argument and political debate" (Kirkhart 2000: 9) used to "convince others to support a position or as a defence from attack" (Rich 1977).

Weiss, writing in 1981, proposed that the term "utilisation" be changed to "use" claiming that utilisation/utility carried mechanistic overtones which conveyed an episodic imagery of intention which was inconsistent with the clearly more subtle and continuous influence of research knowledge on policy formulation. Yet dialogues still revolved around results-based uses of evaluation.

Michael Quinn Patton (1997) argued for consideration of the *process* use, as opposed to the data-based use of information, *benefits arising from the enterprise of being involved* in evaluations. The merit of considering process use becomes particularly obvious in cases of participatory evaluations. Patton (1997: 90) defined the learning arising from participation in the process of evaluation as:

> "individual changes in thinking and behavior, and program or organisational changes in procedures and culture, that occur among those involved in evaluation as a result of the learning that occurs during the evaluation process. Evidence of process use is represented by the following kind of statement after an evaluation: 'The impact on our program came not just from the findings but from going through the thinking process that the evaluation required'."

These benefits accrue through the actual process of being involved in the planning and implementation of an evaluation. In various writings Patton (1997 and 1998) identifies a number of types of process use, amongst these:

- Increasing participants' engagement, sense of ownership and self-determination;
- Program or organisational development creating and refining shared understandings about the intent and implementation of a program;
- Learning to learn; and
- Supporting and reinforcing a program through intervention-oriented evaluation.

Evaluation to Increase Engagement, Ownership & Self-determination

Working collaboratively together increases commitment to programs as people tend to support views that they have discussed and to whose formulation they have contributed, possibly because in the process of being involved and of interacting, preferences are developed (Smith 1997). Participating in the process of evaluation creates a sense of engagement in a valued enterprise for which there is an obvious interest and which also carries an implied expectation of the individual's contribution to that enterprise.

This may be an example of the Hawthorne Effect (Envision 2004) where the mere fact of being the subject of experiment produces improved performance, not as a direct consequence of actual changes in conditions but because attention has been focused on effecting improvements. The heightened awareness of the possibility of improvement increases consideration of such improvements. Regardless of the mechanism, evaluations often improve morale by promoting the impression of being part of a purposeful and dynamic enterprise.

Evaluation for Program Development

Participation in the process of planning and implementing a program evaluation serves to test the reality and soundness of the program logic of the program under extended scrutiny and debate from various views of reality. Evaluation by its nature seeks to make value assumptions explicit and therefore more accessible for examination and testing against others' experience of reality. Logic flaws are exposed and remedied. The enhanced communication which arises from efforts to understand others' logic of causal linkages can lead to the creation of a refined and tested understanding of program goals and the application of different theories of causation can often lead to adjustments in planned implementation. Overall the program stands to be strengthened.

Evaluation for Learning to Learn

By "learning to learn" Patton argues that evaluation researchers and practitioners have their own culture or view of the world that is based on values and standards that others may find quite unusual. He suggests that participating in evaluation can often be a 'cross-cultural' experience in exploring values and norms such as:

> "clarity, specificity and focusing; being systematic and making assumptions explicit; operationalising programme concepts, ideas and goals; distinguishing inputs and processes from outcomes; valuing empirical evidence; and separating statements of fact from interpretations and judgments" (Patton 1998: 226).

These are values prominent in the "culture of critical discourse" (Gouldner 1979) and which underpin the application of the scientific method in structuring reality, testing hypotheses and generating new knowledge (Forss *et al* 2002).

Imperial and Hennessey (2001) researching factors for improving watershed governance in the U.S. reinforce this view with evidence that the mere experience of exposure to performance measures and tracking systems "[plays] an important role in encouraging a systematic approach to addressing specific watershed problems". In a similar manner, prolonged discussion about the impacts of actions as opposed to just the actions themselves tends to heighten participants' sensitivity to the search for impacts in general.

By participating in the culture of systematic inquiry in pursuit of evidence and explanation, which underpins the conduct of evaluations, participants practice the tools of the scientific method as one proven and efficient method of learning to learn.

Patton (1998) suggests that there may also be considerable instrumental benefits to be gained through the acquisition of such personal and professional skills from within the evaluation culture in that many funders are immersed in, and speak the language of, that culture. Additionally such skills in reality-testing may be useful in other areas of personal and professional life.

Evaluation as Program Intervention

Participation in an evaluation can also serve to intentionally strengthen and renew commitment to a program or project. Evaluators discovered early on that extending the conversation about review findings served to make those findings more meaningful. Reinforcement to increase learning is a well-proven technique.

In preparing for their task evaluators will have developed a well-honed understanding of the challenging aspects of the program's purpose, planning, resource allocation and implementation. Subsequent conversations and interactions between participants and informed evaluators provide opportunities to introduce ideas that provoke renewed reflection by the participants, focus and crystallise thoughts and therefore precipitate change. Probing the intent and implementation of a program in the course of data collection interviews for an evaluation can serve to remind participants of the original purpose and goals of the program or project and can galvanise renewed commitment to program outcomes.

This is a technique intentionally now used in adult education courses, self-managed health care and change management training courses where, after an initial training period, participants are later brought back together to 'report' on progress made. It is intended that the report-back session also serve to remind, reinforce and strengthen the original training concepts.

Social science research often laments the fact that it is possible for the mere posing of a question to function as a program intervention. By suggesting a new conjunction of ideas or a slightly different emphasis on some aspect of a program, a new progression of planning and activity is stimulated. In some researchers' eyes, such an intervention violates the research principle that the act of measurement should not influence the

object of measurement itself. Participant-observation is often a favoured research technique precisely because it has the potential of minimise such unintended and unwitting influence. Evaluation as program intervention directly challenges this perceived threat to research validity by actively searching for ways to heighten program outcomes. Evaluation as program intervention may carry potential risks of goal displacement however and the possibility of researchers diverting participants away from the original program intent may need to be monitored.

In short, there are a range of ways in which process use can be a positive influence in helping people to attain the desired outcomes of programs, in that it can "reinforce interventions, increase clarity about the linkage between values and goals, stimulate logical analysis, and contribute to increased effectiveness simply by posing questions the answers to which heighten intentionality" (Patton 1998: 232).

Evaluation Planning for State-level Investment Programs

Across Australia, Federal, State and Territory governments are collaboratively engaged in a visionary approach to environmental and natural resource management (NRM) that relies on devolved regional NRM delivery based on long-term community-owned plans. This approach has been initially supported by two joint, Federal and State government, funding schemes, the *National Action Plan for Salinity and Water Quality* and the *Natural Heritage Trust*. Together these initiatives intend to deliver a shared whole-of-region vision for landscape and resource management together with much delayed institutional reforms and a coordination of multiple layers of planning and governance. Central to successful delivery is a significant level of social mobilisation to develop and nurture on-going community-government partnerships in natural resource management.

A key component of the human and environmental effectiveness of such partnerships is a program and performance monitoring and evaluation system tied to independent natural resource condition monitoring which seeks to identify and incorporate improvement opportunities to support adaptive management by learning communities. The challenge is to ensure that such a program and performance monitoring and evaluation system delivers benefits to all engaged and does not degenerate into a perfunctory performance audit serving the needs of only a few.

In Queensland an important part of regional delivery are the State-level Investment Programs (http://www.regionalnrm.qld.gov.au/planning/state_wide/nap/nap_sip.html), referred to as SIPs. These are suites of projects that are delivered by State government science and social science researchers in order to build capacity in particular areas of NRM. Research areas include salinity and water quality monitoring and modelling, social and economic analysis and impact assessment of NRM initiatives at the regional scale and the development of regionally-appropriate best management practices for horticulture, grazing and broad acre farming. Project managers and officers with strong project management and research skills together with extension and capacity building skills are drawn from a number of state agencies with particular strengths consistent with each research project's focus.

The research projects are intended to produce and disseminate scientific and social science research knowledge and educative materials to support community-based regional NRM organisations. In addition through engagement with researchers and research institutions to support regionally relevant science, the SIPs are intended to

enhance the capacity of all participants to effectively plan and implement an integrated approach to natural resource asset identification, protection and repair.

In the development of the Queensland State Monitoring and Evaluation Framework for regional NRM delivery, the SIPs were identified as one of five initiatives within the State for which an M&E Implementation Plan needed to be developed. Since such a concentration of funds and expertise in programs dedicated to supporting the regional NRM delivery is unique in scale across Australia, significant efforts are being taken to demonstrate their effectiveness. An initial step in planning for the evaluation was to identify and agree on the evaluation questions by which the success of the initiative would eventually be judged.

This planning for eventual evaluation has enabled several of the process uses of evaluation identified in the previous section to be utilised to improve program delivery.

The most significant *program improvements* have come from elaborating what viewing the SIPs as a capacity building program would mean in terms of specifying evidence, audience, deliverables, and timelines. Seen as pure research into water quality modelling or salinity hazard mapping, justification for the research may lie just in the generation of new knowledge. Seen as capacity building research, issues of appropriate and well-targeted communication, relevance of information to the planning tasks of the regional organisations, the timing of deliverables and the specification of acceptable evidence of success become important issues to be discussed across the suites of projects.

Seen as a suite of capacity building projects, for example in water quality, it was imperative that the individual research and modelling projects delivered a coherent package of information supporting regional NRM delivery. As a consequence the six disparate individual water quality projects were intensively reworked to create that integrated and comprehensive package of information for regional NRM delivery. As individual water quality research and modelling projects, each would have contributed its anticipated 'brick in the wall of science' by delivering what it had agreed to deliver. As capacity building projects, the discussions about program intent served to heighten awareness of impacts and prompted a culture shift to an increased sensitivity to program impacts as opposed to program activities, products delivered and services provided.

Pondering the intent of the program provoked the SIP coordinators to seek to actively identify stakeholder needs in order to ensure the products being produced met those needs. This has stimulated efforts to actively engage regional organisations in a more strategic dialogue of shared understandings and planning needs analysis.

Searching for a definition for successful capacity building and for measures by which to verify that success prompted one set of SIP project officers to develop a performance checklist for the quality of their interactions and assistance provided to regional NRM organisations. In short, the performance checklist has become a mechanism to stimulate logical analysis and promote reflection and *learning*.

Clearly, planning for evaluation has served a development and learning purpose. By virtue of their inclusion in national programs, the SIPs will inevitably undergo an independent accountability evaluation to verify that they have delivered the products

and services they proposed to provide. More significantly the developmental benefits of participating in the process of evaluation planning has served as a program intervention which has assisted in both broadening and deepening the effectiveness of the original program by clarifying and 'ground-truthing' linkages between values, goals and actions in a way that no traditional evaluation could have accomplished.

Evaluation Purposes

Evaluation must embrace the trend in NRM that focuses on collaborative approaches to community-owned NRM planning and implementation. Therefore the intent and content of evaluation must change to recognise and capitalise on, amongst other things, the potential and valuable process values arising from evaluation. This shift in thinking is evident in Queensland, including the evaluation process associated with SIPs which includes the community while effecting program planning, engagement and implementation improvements in the process of planning to demonstrate accountability.

Clearly evaluation must respond to varied demands and suit differing purposes. It has several discernibly different but equally important roles to play, amongst these for accountability, for knowledge generation and for development. An accountability role concentrates on the measure of policy and program cost-effectiveness and on assessing efficiency. The knowledge-generating role of evaluation seeks to gain "explanatory insights" into public and social problems, to identify and monitor problems, increase the public and decision makers' awareness of the impacts of these problems and to develop and compare proposed solutions and to propose new methods. Developmental evaluation seeks better knowledge building and sharing, by strengthening institutions through institutional learning, increased responsiveness and development, by assisting others to establish goals and develop strategies toward achieving objectives (Chelimski 1995).

In Queensland the success of delivering the new environmental governance through regional NRM delivery will be dependent on developing strong on-going community-government partnerships in natural resource management. The central question of evaluation is then whether through an effective evaluation process all parties can be assisted to develop a culture of evaluation that will build capacity and commitment to better performance. Increasingly the experience of engaging in the evaluation process is seen to deliver the critical process benefits for learning organisations and learning societies.

Key Lessons for NRM evaluation

The adoption of collaborative approaches during preparation for evaluation greatly enhances the developmental and knowledge-building roles of evaluation by increasing program understanding, exploring and testing the logic of the program through a diversity of realities, and making explicit the links between values, goals and actions. Therefore the intent and content of evaluation must change to recognise and capitalise on, amongst other things, the potential and valuable process values arising from evaluation.

The heightened awareness of the possibility of improvements generated through such preparation increases likelihood of such improvements being made. Increasing participants' engagement, sense of ownership and self-determination increases all participants' commitment to the success of the program.

A learning culture is critical to any successful adaptive management approach, a necessity in collaborative partnerships such as those between community and government in natural resource management. Participation in the culture of systematic inquiry, analysis and reflection in pursuit of explanation, which marks the evaluation process, promotes adaptive management amongst community and government agency participants alike.

References

Chelimsky, E. 1995. The Coming Transformations in Evaluation. In Chelimsky, E. and Shadish, W.R. (eds.) *Evaluation for the 21st Century: A Handbook,* London: Sage.

Cronbach, L.J., and Associates. 1980. *Toward Reform of Program Evaluation: Aims, Methods, and Institutional Arrangements.* San Francisco: Jossey-Bass.

Envision Software Incorporated 2005. *The Hawthorne Effect and Modern Motivation Management.* http://www.envisionsoftware.com/articles/Hawthorne_Effect.html, accessed 8 December 2004.

Forss, K., Rebien, C.C. and Carlsson, J. 2002. Process Use of Evaluations: Types of Use that Precede Lessons Learned and Feedback. *Evaluation* 8(1): 29-45.

Gouldner, A.W. 1979. *The Future of Intellectuals and the Rise of the New Class*. New York: Seabury Press.

Kirkhart, K.E. 2000. Reconceptualizing Evaluation Use: An Integrated Theory of Influence. In V.J. Caracelli & H. Preskill (eds) *The Expanding Scope of Evaluation Use.* New Directions for Evaluation, American Evaluation Association, No.88, Winter 2000. San Fransciso: Jossey Bass.

Imperial, M.T. and Hennessey, T. 2001. Improving Watershed Governance: Lessons Learned from Efforts in the United States. *InterCoast,* Spring.

Leviton, L.C. and Hughes, E.F.X. 1981. Research on the Utilisation of Evaluations: A Review and Synthesis. *Evaluation Review* 5(4): 525-548.

Patton, M.Q. 1997. *Utilization-Focused Evaluation: The New Century Tex.,* 3rd edn. London: Sage.

Patton, M.Q. 1998. Discovering Process Use. *Evaluation* 4(2): 225-233.

Rich, R.F. 1977. Use of Social Science Information by Federal Bureaucrats: Knowledge for Action versus Knowledge for Understanding. In: C.H. Weiss (ed.) *Using Social Research in Public Policy Making*. Lexington, MA.: Heath.

Shulha , L.M. and Cousins, J.B. 1997. Evaluation Use: Theory, Research, and Practice Since 1986. *Evaluation Practice* 18(3): 195-208.

Smith, G. 1997. Making Decisions in a Complex and Dynamic World. In: Kohm, K.A. and J.F.Franklin (eds), Ch. 27 *Creating a Forestry for the 21st Century: The Science of Ecosystem Management.* Island Press, Washington. D.C.

Thoenig, J.C. 2000. Evaluation as Usable Knowledge for Public Management Reforms *Evaluation* 6(2): 217-229.

Weiss, C.H. 1981. Measuring the Use of Evaluation. In: J.A. Ciarlo (ed.), *Utilizing Evaluation: Concepts and Measurement Techniques.* Thousand Oaks. CA.: Sage.

7. Evaluating management effectiveness of protected areas – dealing with diversity

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Introduction

The widely recognised need to improve the effectiveness of management of protected areas (McNeely 1993; Hockings and Phillips 1999) has led to increased interest in development and application of monitoring and evaluation systems that address broad issues of protected area management (Hockings 2003). The 1992 World Parks Congress called for the development of methods for assessing management as part of the Congress recommendations (McNeely 1993). Immediately following the Congress, a number of systems for evaluating management of protected areas were developed (e.g. Courrau 1999; Ferreira *et al*. 1999; The Nature Conservancy 1999; Cifuentes *et al.* 2000), predominantly in Latin America. These methodologies, while addressing many aspects of protected area management, were aligned to the specific circumstances of protected areas in the region where they were developed (for example, they addressed threats relevant to management of tropical forests in Central and South America and issues relevant to protected areas in a developing country context). In the mid 1990s the IUCN World Commission on Protected Areas responded to the Parks Congress recommendations by preparing a framework and guidelines for developing evaluation systems (Hockings *et al.* 2000). In recognition of the diversity of needs for evaluation and differing circumstances and capacities facing protected area managers around the world, IUCN took the approach of developing a framework (WCPA Framework) and guidelines for designing evaluation systems rather than proposing a specific evaluation system with fixed criteria and assessment methods.

WCPA Management Effectiveness Evaluation Framework

The WCPA Framework was developed, piloted and revised in consultation with members of the World Commission on Protected Areas and other protected area managers from around the world over a three-year period. The Framework addresses three main components of management effectiveness:

- Design of individual protected area or protected area systems – important elements include size, shape, external interactions and connectivity. Evaluation may highlight design problems such as exclusion of critical habitat areas, isolation, and lack of protection from external pressures;
- Adequacy and appropriateness of management – examines how management is being undertaken: whether plans are in place, whether the number of staff and amount of funds are sufficient to meet basic needs and whether management meets best practice standards for the region;
- Delivery of protected area objectives– assesses whether protected areas are achieving their stated aims. Measures include biological elements (such as whether key species are surviving, recovering or declining) and social aspects (such as recreational use and the attitudes of local communities).

A management cycle approach (Figure 1) was used to develop the WCPA management effectiveness evaluation framework (Figure 2). In this respect it has similarities to Stufflebeam and Shinkfield's (1985) CIPP (Context, Input, Process, Product) model and management cycle approaches used in many public sector evaluation programs (Evans and Lee 1993; Khan 1993).

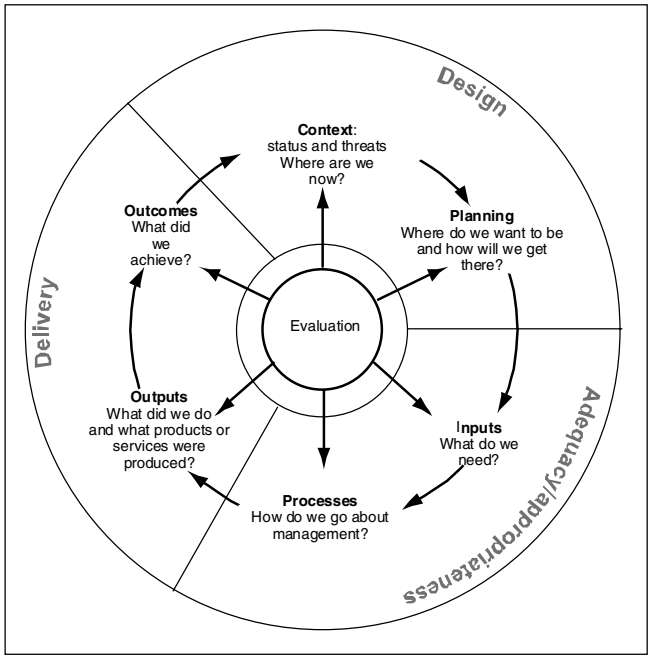

Figure 1. Management cycle for protected areas (Hockings *et al.* 2000)

Elements Of Evaluation	Explanation	Criteria That Are Assessed	Focus Of Evaluation
Context	**Where are we now?** Assessment of importance, threats and policy environment	– Significance – Threats – Vulnerability – National Context	Status
Planning	**Where do we want to be?** Assessment of protected area design and planning	– Protected area legislation and policy – Protected area system design – Reserve design – Management planning	Appropriateness
Inputs	**What do we need?** Assessment of resources needed to carry out management	– Resourcing of agency – Resourcing of site – Partners	Resources
Processes	**How do we go about it?** Assessment of the way in which management is conducted	– Suitability of management processes	Efficiency and appropriateness
Outputs	**What were the results?** Assessment of the implementation of management programmes and actions: delivery of products and services	– Results of management actions – Services and products	Effectiveness
Outcomes	**What did we achieve?** Assessment of the outcomes and the extent to which they achieved objectives	– Impacts: effects of management in relation to objectives	Effectiveness and appropriateness

Figure 2. The WCPA Management Effectiveness Evaluation Framework (Hockings *et al.* 2000)

It is recognised that management effectiveness evaluation can be undertaken for many reasons and it is important that the purpose of evaluation is made clear at the beginning of the process. Four broad purposes for evaluation are outlined below:

- promoting better protected area management including a more reflective and adaptive approach;
- guiding project planning, resource allocation and priority setting;
- providing accountability and transparency;
- increasing community awareness, involvement and support.

While the principal elements and criteria for evaluation, based on the WCPA Framework, can be used in developing evaluation systems for each of these purposes, the emphasis given to different elements of the Framework can vary in response to different purposes and contexts of the evaluation. For example, assessments that are focussed primarily on accountability might put most emphasis on Inputs, Outputs and Outcomes (i.e. what investment of time and money has been made in the work and what results have been achieved), whereas an evaluation intended to support adaptive management might give more equal emphasis to all elements of the Framework. It is also recognised that the criteria used in evaluation can be assessed using either qualitative or quantitative data. The decision on which type of data to use will partly be based on questions of data availability and the amount of time and resources that can be devoted to the evaluation process.

The WCPA Framework has been widely applied in developing evaluation systems for protected areas (Whyte and Ofir 2004). This paper reports on four of those applications that have been developed to address different needs and which have been applied in different contexts around the world and draws some common lessons from across these studies.

Case Studies

The four case studies and the reasons and circumstances for the development of each are:

1. WWF/World Bank Alliance for Forest Conservation Tracking Tool (Dudley *et al.* 2004).

   This is a rapid, site-level system for assessing management effectiveness developed by the WWF/World Bank Alliance for Forest Conservation to track effectiveness of management in all of their protected area project sites around the world. It was developed to provide a rapid means of measuring progress towards the Alliance target of securing effective management in 50 million hectares of forest protected areas by 2005. It is based on an assessment form that is completed by an Alliance project officer and site manager working together to rate (using a 4-point scale) management performance on 30 aspects of management that span the WCPA Framework elements. It is primarily intended to track management performance at a site over time although data from over 200 sites around the world have been analysed to identify common trends in performance (Dudley *et al.* 2004). It is not intended to replace more detailed monitoring of biodiversity outcomes at sites. The system has subsequently been adopted by the Global Environment Facility for all

their protected area projects and a marine protected area version of the Tracking Tool has been developed (K.MacKinnon, pers. omm.. November, 2004).

2. WWF Rapid Assessment and Prioritisation of Protected Area Management (RAPPAM) (Ervin 2002)

   This system, also developed by the WWF Forest Program using the WCPA Framework as a basis for design, provides a means to identify strengths and weaknesses across a protected area system, analyse the range of threats across the system, identify high-priority areas for donor/management support and identify strategic, system-level policy interventions. It also relies on qualitative scoring (100+ questions) completed through a workshop process that brings managers, researchers and other stakeholders together, usually addressing a number of protected areas at one time (for example, management of 110 protected areas in KwaZulu Natal Province in South Africa were assessed through six sub-regional workshops (Goodman 2003).

3. Enhancing our Heritage (EoH) project (Hockings *et al.* 2002)

   This is a pilot project that is assessing the potential to use the WCPA Framework to improve monitoring and reporting in natural World Heritage sites. It uses both qualitative and quantitative data, building on existing monitoring projects where these exist at a site to construct a site-based, site-specific monitoring and assessment system that addresses each of the six WCPA Framework elements of evaluation. Assessments have generally been completed through two workshops – one focussed primarily on managers, researchers and key organisations who can contribute relevant data to the assessment and a broader stakeholder workshop that was used to extend and review and adjust the assessment.

   The underlying premise of the EoH Project is that World Heritage sites undertake the assessment of their own management effectiveness. For the self-assessment process to be rigorous it is essential that site managers develop a team of stakeholder representatives to work with them and participate in the monitoring and assessment process. Although all sites were already engaged in some form of stakeholder dialogue, in most cases this tended to be a one way conversation used to provide or elicit information rather than working with stakeholders to ensure effective site management. The requirement of the project to develop site implementation teams to undertake the project, who then work with a wider group of stakeholders to develop and ratify the initial assessment, has reinforced this need to build strong and coherent local teams to work together to assess management. In some instances it is clear from the initial assessment reports that opportunities for stakeholder input need to be strengthened. There remains a tendency for reports produced largely by managers with limited external input to present a more 'positive' view of management than would result from a more consultative process.

   An example from Latin America highlights the importance of partnerships. In Canaima National Park, Venezuela, the project has been used as an opportunity to combine the separate efforts of civil society, government, local governments and indigenous groups. The local team, which includes managers, NGOs, the private sector, local and national government, indigenous groups and the National Guard

within the park, has demonstrated capacity and commitment to implement the project and quickly identified themselves as a team, ensuring all stakeholders involved in the project are actively engaged in project implementation. In response to the initial evaluation of management, they developed a joint operational plan, identifying the work to be undertaken by each group.

4. State of the Parks reporting

   Recently, the WCPA Framework has been used as a primary input into the design of State of the Parks assessment and reporting systems for NSW and Victoria. Both systems use a mix of qualitative and quantitative data, with the qualitative component collected through a pro-forma in which staff rate performance for various aspects of management. In the NSW case, where assessments have been completed for all 639 protected areas in the state, workshops were used in the development of the system to seek to establish common and accepted standards against which performance would be assessed. In the case of both States, the systems they are developing have twin objectives of providing a basis for regular public reporting on management of the reserve system and providing information that staff can use for planning and adaptive management.

   These four examples have all used the WCPA Framework as a basis for system design although the contexts and purposes of each are different. This common basis has meant that many of the assessment criteria are similar and hence capacity to identify and report on common issues across sites and systems is enhanced, even though the methods of collecting data and making the assessment of management differ greatly. The assessment systems vary from extremely rapid, qualitative judgements to more detailed quantitative monitoring. The emphasis on different elements of the WCPA Framework has also varied in a way that can be understood in relation to the purpose of each assessment system. For example the RAPPAM methodology puts most emphasis on Context (identification of values and threats), Input and Process elements of the Framework as these provide critical information for assessing priorities for intervention across the protected area system. The WWF/World Bank Tracking Tool focuses mostly on Input, Process and Output elements and collection of qualitative data with the intention of assessing changes in management capacity. A design imperative for the system was that it should place minimal demands on site management for additional monitoring or intensive data collection. The Enhancing our Heritage and State of the Parks assessment systems have both given relatively even emphasis to all six elements of the WCPA Framework but with the first having much greater reliance on quantitative monitoring – especially of outcome indicators.

Lessons

Some lessons that can be drawn from experiences with these assessment systems are:

1. Partnerships

   (a) Evaluation systems have been most successfully implemented where they have involved a partnership between managers and other stakeholders.

(b) Establishing evaluation systems and conducting assessments has facilitated partnership formation and consolidation.

This has been most strongly evident in the Enhancing our Heritage evaluation experiences (see case studies documented in Leverington and Hockings 2004) and WWF RAPPAM system (Ervin 2003).

2. Benefits accrued during assessment process

Many of the benefits from conducting evaluations accrue at the site level through the process of evaluation rather than from the actions following on from formal reporting of the evaluation results. This has been true of both the rapid assessment systems such as the WWF/World Bank Alliance Tracking Tool (Dudley *et al.* 2004) and State of the Parks assessments in New South Wales (P.Stathis, pers.□omm.. September 2004), as well as the more detailed Enhancing our Heritage evaluations.

3. Use of evaluation information for adaptive management

Evaluation information can help facilitate strategic thinking at the operational level (i.e. by focusing management attention on the rationale behind management strategies and how they are intended to lead to desired outcomes and then testing the validity of this rationale by monitoring key aspects of performance). The potential to use information from evaluations for adaptive management is enhanced by collecting data on each of the WCPA Framework elements – information on the relationship between performance on various elements can be used to build hypotheses about critical factors impacting on management effectiveness (Goodman 2003; Leverington and Hockings 2004).

4. Importance of involving managers directly in the evaluation process

Involving managers in a central role in the design and conduct of the evaluation system and support from the most senior levels of the management agency enhances application of evaluation findings. The support of senior managers is especially critical – a 100% return of assessments of protected areas in the New South Wales State of the Parks project was significantly helped by the strong support for the project from the Director-General and senior staff (P.Stathis, pers.□omm.. September 2004). Support of senior management has also ensured that the State of the Parks assessment process and findings are being integrated into organisational decision-making systems.

References

Cifuentes, M., Izurieta, A. and de Faria, H. 2000. *Measuring protected area management effectiveness*. Turrialba, Costa Rica, IUCN/WWF Forest Innovations Project, WWF Centroamerica.

Courrau, J. 1999. Strategy for monitoring and management of protected areas in Central America. USA, PROARCA-CAPAS Program, The Nature Conservancy.

Dudley, N., Belokurov, A., Borodin, O., Higgins-Zogib, L., Hockings, M., Lacerda, L. and Stolton, S. 2004. Are protected areas working?: An analysis of forest protected areas by WWF. Gland, Switzerland, WWF International: 32.

Ervin, J. 2002. WWF Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) Methodology. Gland, Switzerland, WWF: 18.

Ervin, J. 2003. Rapid Assessment of Protected Area Management Effectiveness in Four Countries. *Bioscience* 53(9): 833-842.

Evans, B. and Lee, O. 1993. Internal evaluation for decision-making in a children's mental health centre. *The Canadian Journal of Program Evaluation* 8(2): 87-94.

Ferreira, L., Lemos.de Sá, R., Buschbacher, R., Batmanian, G., Bensusan, N. and Costa, K. 1999. Protected areas or endangered spaces? Brasilia, WWF report on the degree of implementation and the vulnerability of Brazilian federal conservation areas, WWF Brazil.

Goodman, P. 2003. Assessing Management Effectiveness and Setting Priorities in Protected Areas in KwaZulu-Natal. *Bioscience* 53(9): 843-851.

Hockings, M. 2003. Systems for assessing the effectiveness of management in protected areas. *Bioscience* 53(9): 823-832.

Hockings, M. and Phillips, A. 1999. How well are we doing? some thoughts on the effectiveness of protected areas. *Parks* 9(2): 5-14.

Hockings, M., Stolton, S., Dudley, N. and Parrish, J. 2002. Enhancing our Heritage Toolkit; Book 1 and Book 2.

Hockings, M., with Stolton, S. and Dudley, N. 2000. *Evaluating effectiveness: a framework for assessing the management of protected areas*. Gland, IUCN.

Khan, M.A. (1993). *A conceptual framework of monitoring and evaluation: the Asian experience*. The AES International Conference: Evaluation - does it make a difference, Brisbane, The Australasian Evaluation Society.

Leverington, F. and Hockings, M. 2004. Evaluating the effectiveness of protected area management: the challenge of change. *Securing protected areas in the face of global change: Issues and strategies*. C.V. Barber, K.R. Miller and M. Boness. Gland, Switzerland and Cambridge, IUCN: 169-214.

McNeely, J.A. 1993. *Parks for life: report of the IVth World Congress on National Parks and Protected Areas, 10-21 February 1992*. Gland, Switzerland, IUCN in collaboration with WWF.

Stufflebeam, D. and Shinkfield, A. 1985. *Systematic evaluation: a self-instructional guide to theory and practice*. Boston, Mass., Kluwer Nijhoff.

The Nature Conservancy 1999. *Measuring success: the Parks in Peril consolidation scorecard manual*. Virginia, USA, The Nature Conservancy, Latin America and Caribbean Region.

Whyte, A. and Ofir, Z. 2004. The knowledge products and services study: addendum to the 2004 external review of IUCN Commissions. Gland, Switzerland, IUCN: 150.

8. Evaluation of Indigenous co-management of natural resources

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Introduction

When Indigenous Traditional Owner groups, other stakeholders and government agencies seek ways to engage in partnerships for natural resources, they are often faced with the challenge of understanding what goals can and cannot be shared, and then how to judge the process and achievement of the agreed objectives. This paper focuses on this challenge and considers the use of evaluation within adaptive management as a useful approach that can support the development of effective Indigenous co-operative management[1] (co-management) agreements. In this context co-management describes a type of partnership between non-government and government natural resource users and managers in which management is formally shared, usually under an agreement (George *et al*. 2004). These arrangements are best known in Indigenous-government resource management that include northern Canada's wildlife agreements (Treseder *et al*. 1999), conservation agreements in National Parks (Smyth 2001; Borrini-Feyerabend et al. 2004), fisheries (Pinkerton 1989) and other natural resources.

This issue is particularly relevant in Australia where many Indigenous co-management agreements (such as the joint management of National Parks) have not been based on equitable negotiations but as a condition of receiving title to land. Adaptive management could be a tool to negotiate consent for both new and existing protected area and other natural resource management arrangements.

Context

This paper draws on presentation derives from two projects funded by the CRC Reef Research, one considering how Indigenous co-management could be developed on the scale of the entire Great Barrier Reef World Heritage Area (GBRWHA), and a second exploring the potential to link adaptive management with co-management and considering local and regional scales. The first project, inspired by Sea Forum's (1999) call for a reef-wide framework agreement, focused on assisting the Indigenous and agency partners to understand their opportunities in co-management and developed a flexible framework for the design or negotiation of co-management for the GBRWHA (George *et al*. 2004). The second project commenced after the Commonwealth Minister for the Environment had ruled out reef-wide negotiations but had opened the way to localised arrangements. This project focused on the practicalities and realities of developing Indigenous co-management partnerships in the Great Barrier Reef using an adaptive management approach (Robinson et al. *forthcoming*). Both projects were conducted with prospective Indigenous partners and the Great Barrier Reef Marine Park Authority (GBRMPA), and the research itself was 'co-managed' (Innes and Ross 2001).

[1] Known in some literature as 'collaborative management', with minor differences in the types and equality of partnership considered.

Co-management and adaptive management

Fundamentally, co-management involves the sharing of power and responsibilities between government and local resource users (Berkes *et al*. 1991). The ideal is equal sharing (McCay and Jentoft 1996), but some conceptualisations of co-management include unequal partnerships in either direction – a dominance of government control or arrangements that could well be described as community-based management with some government involvement. An example of the latter is the Indigenous Protected Area initiative whereby Traditional Owners voluntarily accept protected area status and can choose the level of government involvement in the co-management agreement (see Smyth 2001; Robinson and Munungguritj 2001). Co-management can focus on species, such as wildlife and fisheries; areas, such as northern Canada's regional agreements and Australia's terrestrial national parks; or combinations of these (George *et al*. 2004). Adaptive management is a cyclical, deliberate learning approach to environmental management modelled on the idea of scientific hypothesis testing (Holling 1978). While conventional linear design-then-implement approaches to environmental management may also use evaluation, either periodically or regularly, *adaptive management* is characterised by the hypothesis testing element, and the explicit nature of the cycles with commitment to continual improvement. The need to adapt constantly is assumed, and welcomed.

Rather than believing that an existing management relationship or planned management intervention *will* work, or is the best possible solution to a situation, adaptive management thinks of management actions and relationships like a scientific hypothesis, a proposal for testing. One needs to try the management arrangement or intervention out and collect evidence, through monitoring and evaluation, to test assumptions and to measure how well it has worked (see Walters and Holling 1990; Margoluis and Salafsky 1998). After the evaluation, one improves on it. Adaptive management follows explicit cycles of:

- *assessing* the present situation,
- *planning* some management actions to improve the situation,
- *implementing* the planned actions,
- *monitoring* (collecting relevant information) and *evaluating* (assessing that information) to work out how well the management intervention has succeeded, and why (or why not). This links to the start of the next cycle.

Our innovation in the second project (Robinson *et al*. *forthcoming*) is to recommend that adaptive management be adopted in the development of co-management arrangements within the GBRWHA[7]. As well as being a valuable environmental management approach in its own right, adaptive management offers the opportunity to develop co-management by stages, rather than the parties needing to negotiate the final form of co-management from the outset. This suits the current reality that any co-management arrangements possible in the Great Barrier Reef region in the foreseeable future will be localized and limited initiatives, and that the parties are more likely to develop effective working relationships and arrangements by starting modestly and

[7] There is a new body of literature called 'adaptive co-management' (Buck *et al*. 2001), but this is less explicitly tied to the formal procedures of adaptive management as intended by Holling and his successors. It focuses more on adaptation prompted by unplanned learnings such as responses to shocks, and also on community- based management rather than Indigenous-government co-management occurring under formal agreements.

expanding the range of activity with growing trust and experience (Robinson *et al*. forthcoming).

Evaluation in co-management

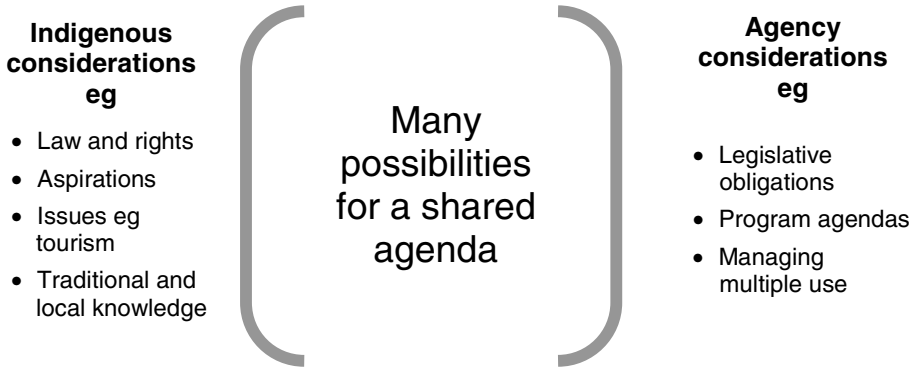
The vast majority of monitoring and evaluation in environmental management concentrates on change within the biophysical environment, in other words *what* the environmental management arrangement aims to accomplish. Rather less attention is paid to *how* the management arrangement works in its context (Bellamy *et al*. 2001). It is important to know whether the institutional arrangements are working effectively *in themselves* as well as in delivering their intended environmental outcomes. In co-management, this is a particularly important issue: it is just as important for the partnership to work well from the point of view of all parties, as for the environmental outcomes to be achieved. If either is lacking, the parties are likely to dissolve the arrangement and lose the prospect of improving environmental and other outcomes (Ross 1999; Robinson and Munungguritj 2001).

We thus argue that two types of evaluation are needed in co-management. One is the familiar – though nevertheless challenging – task of monitoring and evaluating progress towards the achievement of the shared goals. In co-management between Indigenous and other partners, these can be environmental outcomes, such as improved environmental quality or species prevalence, or may be social, economic or political. Many Indigenous people seek to strengthen their cultural heritage and sustain their environmental knowledge, and improve their rights, their employment and economic opportunities, and social harmony, through co-management of their traditional country. Davies *et al*. (1999) argue that Indigenous people need responsibility for evaluating their programs according to their own criteria. Evaluation by outsiders' risks being misdirected since outsiders rarely understand the social and cultural values involved. The other need is for evaluation of the arrangements themselves – the quality of the partnership and its institutional arrangements, working processes, relationships, resourcing, capacities, and ability to deliver.

We see a particular opportunity in evaluation of co-management arrangements by improving the results of negotiations. In our first project we developed the idea of a 'negotiation space', as the fundamental concept of the framework for designing or negotiating co-management (George *et al*. 2004; Ross and Innes 2004). The idea of the 'space' is that the co-managing parties bring a number of 'givens' to the relationship, whether these are different values, priority issues, different laws or management paradigms. As Ross and Innes (2004) argue, when starting co-management negotiations it is often difficult and time consuming to first try and change many of these 'givens', for instance to expect Indigenous people to change their beliefs or customary law, or to expect government to change existing legislation to any great extent.[8] It is far more productive to identify these 'givens' so that they are mutually recognized and understood, then to concentrate discussion and the development of arrangements into the area of potentially common ground. This draws on the negotiating principle (Fisher and Ury 1981) 'invent options for mutual gain'.

[8] This is not to say that these 'givens' in the relationship will not change. After all, the extent to which many co-management agreements exist in Australia is the result of changing legislation, including the Native Title Act *Cwth* (1993) or amendments to the Great Barrier Reef Marine Park Act *Cwth* (1975) which provide for Indigenous representation on the Great Barrier Reef Marine Park Board.

Figure 1: The concept of a negotiation 'space.



The framework 'scopes' nine dimensions that are essential to encompass in any co-management arrangement in which Indigenous people participate. These are issues, laws, paradigms of management, spatial factors and scale, the parties to participate, decision-making structures and processes, operational mechanisms, and information management (George *et al*. 2004; Ross and Innes 2004). For each of these dimensions, the framework spells out the considerations that form the parameters for the space, and suggests the possibilities that can be sought within the shared space.

Issues and challenges

There is a range of issues that pose significant challenges for efforts to set, implement and evaluate the success of agreed goals within the co-management negotiation space. Indigenous Traditional Owners, local stakeholders, and government agencies each hold very *different views* about the environment and how it should be managed. There is also the ongoing challenge of understanding *why and how each party seeks to engage* in the NRM planning and implementation process. Indigenous people seek to establish equitable and ongoing co-management processes which are sensitive to their rights and relationships to their country, and enable them to direct and control the content and implications of resource use and management agreements (George *et al*. 2004). Yet the harsh realities of poor health, housing and economic opportunities also mean that Indigenous people have further goals to embrace within co-management where possible – economic opportunities, strengthening of their cultural heritage, and community development.

Issues that end up in the negotiation space of co-management might not all comply with conventional NRM goals, but reflect an innovative balance between government, stakeholder and indigenous aspirations, responsibilities and authority for a given resource or region. For example, surveillance of fishing that is difficult for agencies to achieve in remote areas but provides opportunities for Indigenous training and employment might be an issue that offers a first step towards formation of a co-management agreement. Harvesting and conservation of marine species, of interest to both parties from subsistence, cultural heritage and conservation points of view, is another issue of mutual importance. Agreements to manage natural resources together will often require clarification of Indigenous and non-Indigenous roles and responsibilities for a particular species in a given area. This is particularly the case for Indigenous people, whose rights to speak for a particular NRM issue is contextualised by their relationship to each other and country, which in turn directs responsibilities for resource allocation and stewardship.

Relationship building between and within the parties is also both a critical ingredient and important challenge for parties to appraise the 'health' of natural resources and environments and the 'health' of co-management partnerships. This includes developing *structures and processes* that can accommodate different decision-making systems held by Indigenous and non-Indigenous parties and accommodating the different *scales* at which each parties' decision-making systems operate best (George *et al*. 2004; Ross and Innes 2004).

It also requires parties to be *flexible* to learn and change from the experience of working together on NRM issues. As Robinson *et al*. (*forthcoming*) explain in some detail, this "co-learning by co-doing process" approach has three key elements.

- *An evaluation system* that draws on indigenous and non-indigenous monitoring systems to measure key indicators and the current state of natural resources and management arrangements;
- *A learning system* at local, regional and institutional levels;
- A *response system* that enables co-managers to act on (i) what has been learnt about ecosystem's processes and structures and (ii) what has been learnt from working together to manage these ecosystems.

There are a number of challenges to implement the evaluation and response components of this adaptive approach to Indigenous co-management. Indigenous people often have a *lack of resources and capacity* to be involved in setting NRM goals and evaluating their success. This includes time and resource issues that inhibit effective Indigenous involvement. Many senior Indigenous Traditional Owners participate in a range of decision-making forums and are overworked. Others don't have the financial resources or transport to be involved in NRM. At the same time, government agencies and other NRM stakeholders also often lack the capacity (including the necessary cross-cultural understanding and skills or political will) to adequately engage in the necessary evaluation processes, and hence many other aspects of co-management.

The evaluation of efforts to manage environments together also requires parties to tackle difficult issues of what to measure and how to measure co-management success. Conventional evaluation approaches focus on tangible outcomes (e.g. increase dugong numbers in a given area) to initiative task-oriented reactions (e.g. improve sea grass habitat). We propose that less tangible outcomes (e.g. improve Indigenous- government agency relationships) also need to be considered and these may require more process-orientated responses (e.g. co-managers have access to good information presented in an appropriate way).

Even then, the negotiation of how these measures will be evaluated is a challenging prospect. For example, how do you monitor and evaluate a relationship? How would conflict between parties be judged? As negative, or as evidence of a robust relationship and an opportunity to move forward? How can the effectiveness of consultation efforts be measured? Even the appraisal of and response to environmental change will require negotiation. As Indigenous, coastal and inland parties and government agencies in the Great Barrier Reef have found, there are a variety of viewpoints about why dugong numbers are decreasing and how parties can and should respond to this issue.
This adaptive and collaborative approach to evaluation also requires parties to resolve issues of compatibility between measures of co-management effectiveness. How parties

weigh up indicators of 'healthy' co-management relationships with indicators of a 'healthy' ecosystem to evaluate and guide co-management progress will invariably present some difficulties.

"Co-learning by co-doing" – key lessons

We now proceed to argue that the 'space' approach can be combined with adaptive management principles to offer a new way of developing co-management itself. Rather than always having to be designed or negotiated as a complex and comprehensive set of arrangements (the current expectation), co-management can be developed iteratively from small beginnings. For instance issues and goals that are shared would set the appropriate negotiating space for a process of mutual learning from experience, whereby co-managers can experiment with actions and relationships, and evaluate the success of their evolving co-management arrangements on the basis of negotiated criteria. This is illustrated in Figure 2.

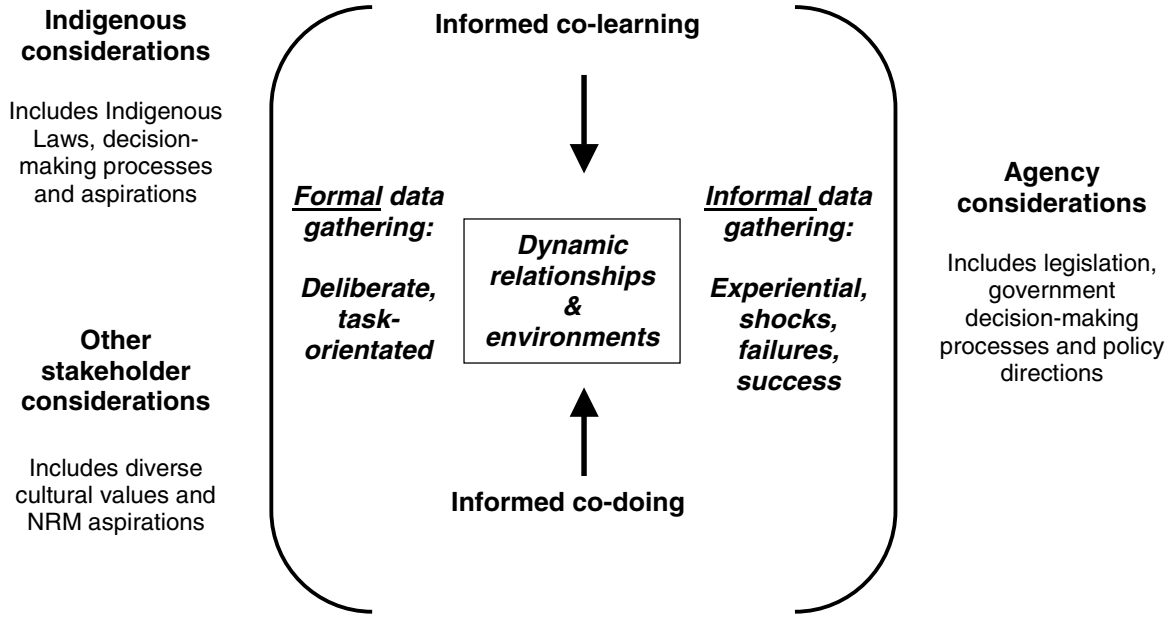


Figure 2: An adaptive approach to developing co-management through evaluation

In this paper we have focused on combining adaptive management with co-management and advocated a "co-learning by co-doing" experimental process that is conducted by *all* (Indigenous, government and other stakeholder) parties willing to engage in the co-management of natural resources and regions. This is particularly important given that Indigenous co-management arrangements are often negotiated in dynamic environments - whether that be the establishment of a protected area, a regional NRM plan, or to deal with a threat to the health of an ecosystem – and evolving relationships as parties learn how, and how not to work together.

This approach has a number of key features:

- First, it is important that parties first identify *what* criteria are, or are not, held in common and also *why* differences and similarities exist so that co-managers can negotiate all aspects of the adaptive co-management process. This needs to be done in the spirit of continued improvements and mutual learning. It must rely on both

formal (deliberate data gathering) and informal (experiential data gathering) sources of information.

- Second, co-managers must acknowledge that some aspects associated with this goal may not be shared or agreed. But the focus remains on steps towards goals that can be agreed, then looking forward from each milestone within the adaptive management cycle as it is reached. In Figure 2, these common goals would enter into the negotiation 'space' to create a productive dynamic (and tension) for parties to 'co-learn' from 'co-doing' NRM activities, partnerships and evaluation.
- Finally, this approach advocates that all parties involved in co-management need to be committed to experimentation and adaptation with natural resource management approaches and relationships. This includes enabling parties to pursue some goals alone as long as this does not conflict with common objectives. The essence to this process is respect.

This approach offers an innovative idea that pushes the paradigms of conventional co-management and adaptive management approaches. We propose an approach to development of co-management based on a cyclical and developmental rather than a linear process. It thus contrasts with the early terrestrial joint management arrangements in Australia, whereby arrangements initially negotiated were envisaged to provide an enduring and potentially inflexible template for future activities and relationships. Such an approach might be particularly useful for resources and areas where there is contested authority between Indigenous and government parties – such as the issue of property rights and management responsibilities for areas and resources in the marine environment. In such an approach, emphasis is on co-learning by co-doing, rather than anticipating and negotiating all aspects of a co-management approach from the outset.

In this view, evaluation takes place within an adaptive management paradigm. This would not simply monitor and respond to Australia's natural resources and ecosystems on the basis of government or scientific-based evaluation models and measures (Davies et al. 1999), but adopt the performance criteria of all parties to the co-management. It would focus as much on the performance of the management arrangements, as on the environmental outcomes.

We advocate that co-management and adaptive management can inform one another. This will enable evaluation to incorporate cross-cultural values and decision-making processes and provide a useful tool for Indigenous groups, government parties and other stakeholders to gauge their progress based on negotiated criteria and measures of NRM success.

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References

Bellamy J, Walker DH, McDonald GT and Syme GJ. 2001. A systems approach to the evaluation of natural resource management initiatives. *Journal of Environmental Management*. 63: 407-423.

Berkes F, George R and Preson RJ. 1991. Co-management: the evolution of theory and practice of the joint administration of living resources. *Alternatives* 18: 12-18.

Borrini-Feyerabend G, Kothair A and Oviedo G. 2004. *Indigenous and Local Communities and Protected Areas. Towards Equity and Enhanced Conservation*. Guidelines on policy and practice for co-managed protected areas and community conserved areas. Best practice protected area guidelines Series No. 11, IUCN, Gland.

Buck LE, Geisler CC, Schelhas J and Wollenberg E. 2001. Biological Diversity: Balancing Interests through Adaptive Collaborative Management. CLC Press LLC, Florida.

Davies J, Higginbottom K, Noack D, Ross H and Young E. 1999. *Sustaining Eden: Indigenous Community Wildlife Management in Australia.* Evaluating Eden Series no. 1. International Institute for Environment and Development, London.

Fisher R and Ury W. 1981. *Getting to Yes: Negotiating Agreement Without Giving In*. Houghton Mifflin, Boston.

George M, Innes, J and Ross H. 2004. Managing sea country together: Key issues for developing co-operative management for the Great Barrier Reef World Heritage Area. *CRC Reef Technical Report No. 50*. Townsville.

Holling, C.S. (ed.) 1978. *Adaptive Environmental Assessment and Management*. Wiley, New York.

Innes J and Ross H. 2001. Co-managed research as a strategy for informing the development of indigenous and government management partnerships over the Great Barrier Reef. Paper presented at *International Association for the Study of Common Property Inaugural Pacific Regional Meeting*, Brisbane, Qld, 2-4 September 2001.

Margoluis R and Salafsky N. 1998. *Measures of Success: Designing, Managing, and Monitoring Conservation and Development Projects*. Island Press: Washington.

McCay BJ, Jentoft S. 1996. From the bottom up: participatory issues in fisheries management. *Society and Natural Resources*. 9: 237-250.

Pinkerton E. (ed.) 1989. *Cooperative Management of Local Fisheries: New Directions for Improved Management and Community Development*. University of British Columbia Press: Vancouver.

Robinson CJ and Munungguritj N. 2001. A Yolngu framework for cross-cultural collaborative management, in Baker R, Davies J and Young E (eds) 2001. *Working on Country. Contemporary Indigenous Management of Australia's Lands and Coastal Regions*. Oxford University Press: Melbourne, pp. 92-107.

Robinson CJ, Ross H and Hockings M. *forthcoming*. Development of co-management arrangements in the Great Barrier Reef: An adaptive management approach. *CRC Technical Research Report.*

Ross H. 1999. New ethos, new solutions: lessons from Washington's co-operative environmental management agreements. *Australian Indigenous Law Reporter* 4: 1-28.

Ross H and Innes J. 2004. A framework for designing co-operative management for the Great Barrier Reef World Heritage Area. *IASCP Conference*, Oaxaca, Mexico, 9-13 August.

Sea Forum. 1999. *Aboriginal involvement in management of the Southern Great Barrier Reef. Discussion Paper.* Sea Forum, Brisbane.

Smyth D. 2001. Joint management of national parks, in Baker R, Davies J, and Young E (eds) 2001. *Working on Country. Contemporary Indigenous Management of Australia's Lands and Coastal Regions.* Oxford University Press, Melbourne, pp.75-91.

Treseder L, Honda-McNeil J, Berkes M, Berkes F, Dragon J, Notzke C, Schramm T, Hudson RJ. (eds) 1999. *Northern Eden: Community-based Wildlife Management in Canada.* International Institute for Environment and Development, London.

Walters CJ and Holling CS. 1990. Large scale management experiments and learning by doing. *Ecology* 71: 2060-2068.

9. Evaluating natural resource management investment performance with multi-attribute utility theory

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Introduction

Multi-attribute utility theory (MAUT) provides a theoretical framework for the construction of indices that combine multiple indicators in different units. Formal application of MAUT can help improve the repeatability, transparency, auditability and robustness of natural resource project and program evaluations. This paper shows how MAUT was used in *ex ante* evaluation of conservation contracts in the United States and then explores issues of 'automating' evaluation procedures with MAUT. It is concluded that human judgements cannot, and are unlikely to ever be, wholly captured within a MAUT index. However, MAUT can provide a firm theoretical foundation from which to include subjective elements.

The Issue

Most evaluation exercises involve the assessment of performance across multiple indicators measured in multiple units. When making explicit comparisons between projects or programs it can be useful to summarise the indicators with a single aggregated index. This can make the complexity of numerous indicator movements readily interpretable to policy and decision makers. It also allows the explicit comparison of one project, program or policy's performance relative to alternatives. The construction of an index, assembled with multiple indicators, is achieved either through formal or informal application of multi-attribute utility theory (MAUT; Keeney and Raiffa 1976, 1993). In a critique of the US Environmental Protection Agency's index of watershed indicators Schultz (2001) argues that explicitly basing index construction on MAUT would avoid practical problems of internal consistency and interpretation. This is because MAUT imposes a set of formalised rules, or axioms, for the measurement of utility. In other words MAUT provides a robust methodology that permits the analyst to safely 'add apples and oranges'.

This paper explores the means by which MAUT can be used to strengthen multi-attributed performance measurement in the *ex ante* and *ex post* evaluation of natural resource management (NRM) programs or projects. The paper commences with a brief explanation of the MAUT process. It then explores the development and application of MAUT indices in practice. The paper concludes with a discussion of the extent to which MAUT indices can be used to 'automate' evaluation processes. It is concluded that human judgements cannot, and are unlikely to ever be, wholly captured within a MAUT index.

The Evaluation Approach: MAUT

A MAUT model can be structured as a matrix of attributes and decision options. The raw score for each decision option *i* against each attribute *j* is sometimes denoted as $x_{i,j}$. The matrix is accompanied by a vector of weights defining the importance of each attribute. Generally weights are constrained to be non-negative and sum to one, although numerous approaches are possible. The matrix and weights vector for an MCA model can be written as:

$$X = \begin{matrix} x_{1,1} & \cdots & x_{m,1} \\ \vdots & \ddots & \vdots \\ x_{1,n} & \cdots & x_{m,n} \end{matrix}$$

$$\overline{W} = w_1 \ldots w_n \text{ , where } \sum_{j=1}^{n} w_j = 1 \text{ and } 0 \geq w_j \leq 1$$

The process of MAUT involves these stages:

1. Identify the attributes, which collectively describe the overall utility of all relevant decision options.
2. Identify the set of actions, projects or programs being evaluated.
3. Weight the attributes in terms of their importance.
4. Transform the attribute scores, measured in different units, into commensurate units.
5. Define an aggregate utility function, which combines the transformed scores and weights to measure the overall utility of each option.
6. Conduct sensitivity analysis on the weights, attribute scores, transformation methods and types of utility function.

The initial structuring of the decision problem, identifying the decision options and criteria, is arguably the most important phase. This defines the nature of the decision problem for all subsequent analyses. Often it is difficult to conceive attributes without first seeing the list of decision options. The decision options will help the decision maker understand what they are seeking to achieve from a particular decision. Keeney and Raiffa (1993) indicate that attributes used in a MAUT model should:

- Be non-redundant, minimising cases of overlapping or duplicate measures. In most practical applications of MAUT there still exist traces of redundancy despite the analysts' best efforts. Sometimes these can be handled by modelling inter-attribute dependencies in the utility function.
- Provide as comprehensive measurement of decision objectives as possible. This means it should not be possible to identify additional attributes that provide more complete measurement of the decision maker's objectives, subject to data availability and other practical constraints.
- Be measurable. Sometimes qualitative judgements are used where quantitative data are unavailable. Typically it will be preferable to have objective units measured with robust and repeatable scientific techniques.

The selection of attributes can be driven by data availability or a firm theoretical framework which guides the search for suitable data. Niemeijer (2002) describes these two options as a data-driven approach versus a theory-driven approach. The data-driven approach can lead to high levels of accuracy but lower levels of relevance to a decision maker's goals. The theory-driven approach can lead to highly relevant indicators but an absence of measurable data. Clearly both approaches have advantages and disadvantages. The actual approach taken will depend on the specific circumstances under which MUAT is being applied. Often the 'sound theoretical framework' for attribute selection must be compromised when crucial data is unavailable.

Implementing MAUT: A Case Study of the US Conservation Reserve Program

The many techniques, frameworks and software packages for solving MAUT problems have come under strong demand from managers of major NRM programs. This is because the NRM evaluation exercise typically deals with multiple social, environmental and economic objectives measured with attributes in conflicting units. Rarely will all objectives hold equal importance and generally they will be valued differently by different stakeholder groups, which introduces demands for transparency and auditability. These requirements have led to widespread adoption of MAUT procedures. Here the application of MAUT is explored within the context of the United States Conservation Reserve Program (CRP). Policy documents in the CRP do not explicitly refer to MAUT, but it is argued here that the development of benefits indices in the CRP confirms to the MAUT approach, even if only on an informal basis.

The CRP is one of the United States' largest agricultural conservation programs in terms of areal coverage and federal expenditure (Ribaudo *et al.*, 2001). It is funded under Title 2, "Conservation", of the 2002 US Farm Bill. The program is administered by the Commodity Credit Corporation (CCC) through the Farm Services Agency (FSA) of the United States Department of Agriculture (USDA). The CRP was first authorised in 1985 under the *Food Security Act* and was subsequently reauthorised in 1990 and 1996.

On a voluntary basis the CRP makes rental payments available to farmers for long-term retirement of farmland, where such land is usually retired for a period of 10-15 years. The CRP is administered as a competitive tendering system, whereby farmers make rental offers to the program administrators. The benefits of each bid are assessed by calculating a multi-attributed environmental benefits index (EBI). This process aims to maximise conservation benefits within budgetary constraints. For the 2002 fiscal year alone, over 590,000 CRP contracts were signed covering an area 34 million acres with annual rental payments of US$1.6 billion. This gives a mean annual rental payment of US$47.19 per acre. It can be seen that the vast majority of CRP contracts are held within the cropping lands of the Midwest. The more populated States on the east and west coasts, such as California and New York, have far fewer contracts. It is also within the Midwest region where concern over soil erosion and sedimentation of the Mississippi River is greatest.

Agricultural producers submit applications for CRP enrolment to their local FSA county office. To be eligible an applicant must generally have owned or operated the land for at least one year. The FSA may seek assurance that the land has not been recently

purchased with the intent of placing it under the CRP. The applicant can bid for land retirement at any amount. Often the actual bid is at, or near, the maximum acceptable rental rate as set by the FSA. Additional cost share assistance is made available to applicants who establish permanent ground cover. CRP cost share can be up to 50% of the cost of groundcover establishment. The impact of maximum acceptable rental rates is discussed below.

The EBI is defined using MAUT concepts, albeit on an informal basis, and measures the level of environmental service attained through contracted land retirement. Its primary use is to assess comparative benefits from land retirement from alternative applications. It also has some application in *ex post* program evaluation. As such, it would be hard to overstate the importance of the EBI in allocating CRP funds. It has been steadily refined over time and the attributes used under the 20th signup of the CRP are shown in Table 1.

Table 1. Criteria used to define the US CRP's environmental benefits index (Ribaudo *et al.* 2001)

Weight (max points)	***Criteria***	***Description***
100	Expected benefits for wildlife habitat cover.	The score for this criterion is influenced by the mix and selection of plant species used in replanting. Other factors include the site's proximity to conservation land, provision of food for wildlife and restoration of wetlands.
100	Potential benefits to surface and ground water quality.	The application will receive 30 points if at least 51% of the site is within a State water quality protection area. Further points are obtained where there is increased capacity to reduce pesticide or herbicide contamination of groundwater and reduce sediment and nutrient runoff into rivers or streams.
50	Enduring benefits of conservation practice, likely to remain in effect beyond the 10-15 yr contract period, including the benefits of carbon sequestration.	Under this criterion the application will receive greater points if hardwood tree species, such as Atlantic White Cedars, are established. Points can also be awarded for the restoration of rare or endangered habitats.
35	Air quality benefits from reduced wind erosion.	This attribute takes into account the potential for wind erosion given soil types and other site characteristics. More points are also awarded if the site is within a problematic air quality zone.
25	Location within State and/or Federal areas of conservation significance.	If the site is at least 51% within State or National Conservation Priority Area (CPA) and other related criteria are met, the application will receive a score of 25.
200	Cost of the contract.	The final weight of this factor is determined after all contracts are received. It can play a major role in determining the EBI. It provides a means for applicants to increase their EBI score by lowering their bid level.

The reason for including the cost attribute was to provide applicants with an incentive to lower their bid level. For every US$1 dollar below the maximum rental rate, the application receives an additional point under the cost criterion. This increases the likelihood of the bid being successful. The landholder can also obtain a higher score under the cost criterion if they increase their cost share of establishing permanent ground cover. The weights of EBI attributes, defined by the maximum scores, were set by USDA technical staff. Questions were raised about the extent to which criteria weighting was a 'technical' problem. Alternative models could obtain stakeholder input for how criteria weights are set.

Key Lessons

In the United States CRP a MAUT approach was used to partially automate conservation contract purchasing decisions. A set of attributes were identified along with a common scaling system. The attributes were weighted (via maximum scores) and collapsed into a single index. Although CRP policy documents do not explicitly describe a 'MAUT' process, the MAUT approach was used albeit in an informal manner.

In the 2002 fiscal year the United States Department of Agriculture signed 591 261 contracts with farmers under the CRP (USDA 2003). In order for this many contracts to be processed automation is unavoidable, the transaction costs would otherwise be excessive. The EBI enabled the benefits of each bid to be measured relative to the benefits of other bids. This was a considerable achievement given the diversity of landscapes across the entire continent of the United States.

When the use of MAUT is contemplated in other programs, which may not involve as many projects as the CRP, the extent to which it automates *ex ante* or *ex post* evaluation decisions is often a major issue of contention. McAllister (1980) cautions against reliance on 'grand indices' which attempt to summarise a multitude of factors relating to environmental well-being in a single number. McAllister argues that there is no substitute for the detailed, time consuming and personal process of evaluation. This implies the analyst's subjective judgements are at some point unavoidable.

The use of subjective judgements in an evaluation exercise can create concerns over transparency and repeatability, in addition to practical concerns about transaction costs. Technical experts that are free from any bias are almost impossible to find. People working within a field for considerable time with highly specialised skills are often closely connected to the programs they evaluate. It can be difficult to find persons with sufficient skills that can avoid a conflict of interest. Another drawback with expert judgements is their lack of repeatability and transparency. Two experts will often come to very different conclusions. It may be difficult for stakeholders to receive a consistent explanation of why one project (or program) was favoured over another.

It is rare that policy makers will surrender an evaluation exercise to MAUT alone. Sometimes the transaction costs make a more deliberative approach unfeasible. Generally there will be avenues for incorporating subjective judgements that may also involve the insertion of political preferences – a matter which cannot be ignored in most evaluations. The key benefit of MAUT is to provide a structural foundation from which adaptations can occur to reflect political realities and data/information limitations.

Conclusion

The formal application of MAUT will assist evaluation exercises, which involve performance measurement in multiple units across multiple indicators. MAUT provides a robust and transparent analytical framework for performance measurement. However, the MAUT approach does not take the analysis to a final conclusion. There will always exist subjective elements related to performance measurement that cannot be adequately handled within a structured model. Generally the evaluation process will benefit from the use of MAUT because it provides an analytical framework to provide a robust foundation for subjective judgements. Without this robust foundation it is difficult to ensure transparency, auditability and repeatability in NRM evaluation.

References

Keeney RL, Raiffa H. 1976. *Decisions with multiple objectives: preferences and value tradeoffs.* First Edition. Cambridge University Press. London.

Keeney RL, Raiffa H. 1993. *Decisions with multiple objectives: preferences and value tradeoffs*. Second edition. Cambridge University Press. London.

McAllister DM. 1980. *Evaluation in Environmental Planning*. The MIT Press. Cambridge.

Niemeijer D. 2002. Developing indicators for environmental policy: data-driven and theory-driven approaches examined by example. *Environmental Science and Policy* 5: 91-103.

Ribaudo MO, Hoag DL, Smith ME, Heimlich R. 2001. Environmental indices and the politics of the conservation reserve program. *Ecological Indicators* 1: 11-20.

Schultz MT. 2001. A critique of EPA's index of watershed indicators. *Journal of Environmental Management* 62: 429-442.

USDA. 2003. *Conservation Reserve Program Fiscal Year Summary FY 2002*. United States Department of Agriculture, Washington DC.

10. CIRM Symposium Discussion

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One of the key aims of this symposium was to encourage sharing of ideas about challenges and approaches to evaluation amongst participants. To encourage in-depth discussion during this symposium draft papers were circulated beforehand and following brief presentations on each paper (about 12 minutes) questions from the floor were recorded but not answered. These questions were then synthesised into a series of issues for discussion and addressed by the panel of presenters with participants in a discussion session. Through this discussion it emerged that participants are struggling with evaluation across a broad range of areas – from the broader planning system to theoretical and practical aspects. As outlined in the introduction to this volume, evaluation is central to identifying change, supporting an adaptive approach that is flexible enough to meet the challenge of change, and enabling progressive learning at individual, community, institutional and policy levels. Clearly, from this discussion, there are many challenges for players at a range of scales and at all levels. The following is a summary of the subsequent discussion grouped by topic.

The planning system

The broader planning system for NRM has undergone considerable change in recent times with more responsibility being divested from government to community and increased emphasis being placed on community approaches. But is this resulting in better planning, i.e. is it an accommodating process that is enabling NRM planning to succeed? Furthermore how are current evaluation studies supporting and monitoring this process to see if it is being effective?

> *One issue is the appropriate theoretical basis for planning. Theory provides the conceptual base of understanding – a context of the system within which we are working. We can understand that we are dealing with a complex system with many components and interrelationship. Should we be using systems theory or is it hierarchy theory? Or are there other theoretical constructs that we should be considering? Do we really understand the theory and apply it properly? Or are practitioners even using theory at all? The whole idea of using a 'systems approach' sounds like mantra – are we clear about what is 'systems thinking' or a 'systems approach'?*
>
> *A systems approach can be heavy handed or there can be a more common sense version in which you get the context for choices and collective action environment. The important bit is having a mapped structure and process with the systems and meaning.*
>
> *What about deliberative models in NRM, where participants get to decide the structure and content? The deliberative stuff represents a more bottom up push in a top down system but this is based on the assumption that people know what is going on.*
>
> *Governments are poor in community engagement which creates the perception that government is not genuine but 'consultation' is a code word for 'we are going to subject you to change' for example in vegetation management. We get caught in the cross fire.*

It is more socio-political. The push for participative democracy has been going for some time now – about a generation. With this transition of devolving responsibility – and decision-making power – there is a time lag on both sides. Government has realised that it is not that effective and is now trying a new approach. There is a groundswell to this new approach.

The system includes us as individual planners and we all have a worldview that we take into the evaluation arena. So what are these different views and how can they work to solve evaluation questions? What are our own mental models and psychology and how do we open up our subconscious to become more aware of our own decisions and approaches?

For planning practitioners working within government, a challenge for their role is whether they can they change the planning system or is their role just about spending dollars to get outcomes within the current system. The 'frames' used is one of their biggest issues.

We need to use an adaptive model where we are absolutely committed to putting the learnings back into the system.

Governance issues

Governance issues discussed centre around the role and structure of regional bodies within the Queensland NRM system.

There is an interesting relationship between the regional bodies, the state and commonwealth. The Queensland regional bodies are a local and community organisation but separate to the state and federal government. They are a structural oddity compared with other states.

When regional bodies were established it was not then part of the philosophy for the State to be part of the process. But to have a regional plan not a regional body plan we have tried to achieve through a Regional Coordination Group – so we have the focus of collaboration at that point. But this needed a cultural change within agencies to talk within and to themselves. There is now lots of collaboration between Coordination Groups and regional bodies but more cultural change is needed and this could be 5-10 years away.

The current arrangement is a hangover from previous system and reflects the choice of lens used and this outweighs everything else. There needs to be changes in institutional arrangements.

So do we want to reduce complexity or celebrate it and then use it to come up with a better model?

Why do we do it this way? The previous arrangement was inadequate so we need ideas on how we can do it better on the policy agenda. We need to recognise the problems but ask experts how to do it and then have a clear signal about changing paradigm. Then there is a problem with simple cost benefits of where to put marginal dollar needed to be spent on institutional strengthening. People find this hard to cope with. We need to spend deliberative time to do institutional strengthening.

The role of regional bodies is still not clear - the wheels are still spinning. The best incentive is to have clear roles and to be able to see the future. In the case of the Wet Tropics the Regional Coordinating Group does have a clear role at regional level – especially in showing integration of statutory elements and also non-statutory elements. Yet people say we spent two years on committee and what did we get? Regional NRM plan should have a role in jigsaw puzzle of planning and be bolted in with clear role.

State level implementation

An important issue for the state level is the relationship with regional bodies and how that effects planning and implementation as well as evaluation.

We need to look at the interrelationships between government and non-government, especially with regional bodies being outside government (an interesting comparison with other states). Of particular interest is the governance issues that this creates, for example, the framework in which they work in does not recognise the many governance issues of being a regional body.

At the State level we are a Big Mac – we are squashed from above and below. Now we are creating a mirror image of this problem with regional bodies.

What are the sacred cows – let's explore this. One sacred cow is 'alliancing' and what is implied by this. Another is 'capacity building' – this is applied loosely so we don't get anything.

Stakeholders should be involved in developing evaluation process. Do regional bodies feel they have been engaged? If not, how can their engagement be done better?

Regional level evaluation

At the regional level there is conflict between different purposes for evaluation and uncertainty in how this can be addressed. There were also lots of practical issues and challenges raised about the scale, timing and volume of evaluation.

In the purpose for evaluation, how do address the issues of the conflict between the different purposes for evaluation? There is a difference between what is needed for evaluation for the funders and what is needed for evaluation of the regional activity and so how do you address this?

If planning is at landscape level and then implementation is at property level – how can you include these two areas in evaluation?

How much planning is enough? What is a healthy level of timing and volume of evaluation? What are the 'things being counted' and are they dictating the output rather than being the output that is really needed? Do the key performance indicators actually have connection to what is the real desired outcome (rather than just being associated with it)?

How much is enough is a strange question if we regard it as lifelong learning. Many consider it is static – not recognising that evaluation is moving, so evaluation needs to be regarded as fundamental – this underpins an adaptive framework.

The key thing is how we go from planning to implementation? There is the assumption that bodies have connectivity and integration. But what we are doing is putting bodies in a system where that isn't the case. We have good science but nowhere for it to sit? Biggest change required in the lens is how to move from planning to implementation.

What about the cumulative effects of evaluation – "you are the 4th mob of evaluators" – what is the impact of cumulative effect of multiple similar activities occurring simultaneously. The onus for us is to ensure that we consider how we deliver research so that negative impact on others is reduced.

It is fine to evaluate output but unless getting to where you want to can't tell where to make change. We need production line evaluation so can know where to make changes. The issue is for us also to change the way we do business. We are attempting to work together but also to align some of activity of the regional process. How well we do that is significant issue and determines process is still continuing and is so important for regional bodies but also for government.

To see any outcomes you need to have data and so many areas don't have data which then highlights the importance of monitoring.

Participation and engagement in evaluation

How we view the role of participation in evaluation is critical. Historically we have not had participation in evaluation but the situation is changing.

From the point of view of the plans there are major issues between 'top down' and 'bottom up'. The early community-based plans had lots of community ownership – then NHT2 and NAP brought enormous accountability and different vision. The community sees that and are confused about if it is an NRM planning process or just a 'give me the money' process. The consequence is a completely different type of plan and so links to community groups and now ownership are major issues. There is a democratising of the plan to meet new planning process – with competing aspirations.

We have experience with this type of evaluation with engagement of the key stakeholders. They value it and are willing to be part of but have very different and specific views on success or what should be evaluated. It is important to get view across a range of stakeholders and not necessarily just the group that has commissioned the work but by groups who are affected as well.

What about the transaction costs that, as a tax payer, I don't want to fund. What is 'nice' as opposed to what is 'relevant' and I wonder to what extent we see community engagement as necessary as opposed to simply a transaction cost.

The whole idea of engagement is crucial because otherwise you don't know how the system will embed the required changes needed. How will you understand if it will work? If people are involved and thus benefit increased capacity to problem solve then do we value this and build it in?

When we talk about engagement, often we engage with same old suspects. We engage with the community (and they may not know what NRM is) so we need to build capacity in a real way. It will be exercise in navel gazing and a waste of time unless a large part of community can participate

Involvement of stakeholders – are regional stakeholders engaged at the right time in evaluation and do they feel ownership in the evaluation process? We need to keep the way we communicate this stuff comprehensible.

If a co-management style of evaluation is adopted broadly what are the necessary changes in terms of funding body requirements?

Non-negotiable items – how far should evaluation go to try and change non-negotiable items – how critical are they for effective change? What is the role of trust in shaping the space for negotiation?

We have seen positive experiences and outcomes in Latin America. Project staff got quite different responses when they went to community as part of evalution and management phase, rather than when they approached a community to ask specific questions on a particular topic. Thus opening up the evaluation process but holding the criteria up to review and comment by community has changed dramatically the nature of the relationships.

There are various ways to look at evaluation in NRM and so we really need to decide what is the purpose and then that decides who is involved and engaged. Need to tighten up evaluation otherwise there is the problem of too much evaluation. There is a legitimate place for range of different needs and methods. Participation is an important part of getting to where you want to be in long term. The 'accountability' type of evaluation doesn't contribute to adaptive management.

We need to accept that some kinds of evaluation will happen for accountability for public funds. But the 'audit' professionals will change and start talking to people. Also if they are government programs then the government feels they own them and it is hard for them to give up ownership as bureaucrats want to be in control and won't give up power. It is a difficult position championing rhetoric with institutional position about control. If we are serious about more of a partnership approach then mode of evaluation and thinking needs to be sorted on day one. There is tension, the default setting of accountability versus ownership, i.e. who has responsibility and who has a voice.

The whole concept of participation - terms like partnership, engagement, etc are used very sloppily. Nice typology and models define these and need to explore and describe type of participation that is appropriate. Different types of participation appropriate at different times.

The issue of levels of participation is so complex and we are just skimming at the surface. There are other issues such as citizen rights, who is participating, etc that needs unpacking.

Lessons from other situations

There are many case studies of evaluation, so what can we learn from other situations?

Canadian Model Forest experiment – multi stakeholder, multi objective, multi use.
Regional Forestry Agreements – can we translate the lessons from the RFA to the NRM situation?