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Project CWE 11: Sustainable Use of Rangelands in the 21st Century

Abstract

The Western Division of New South Wales is a region enmeshed by complex and outmoded administration and laws. There is little diversity of production, some stakeholders are in conflict over land and water resources, services are declining, the population is ageing and debt and welfare levels are high. There are pockets of innovation, and its people are used to coping with adversity, but institutional change is needed to make the region much better prepared to face the 21st Century. This project was designed to bring about institutional changes that would foster regional resilience – that is, the capacity to cope with disturbances. It engaged Aboriginal peoples, agro-pastoralists, conservationists, and the minerals and tourism industries in developing visions for the future. These stakeholders also identified compatibilities and conflicts among their visions. The project brought together policy makers from 50 organisations in developing proposals for institutional change that could realise stakeholders' visions, and increase the resilience of the region. Project outputs included maps of stakeholders' land use values, proposals for institutional change and identities of potential champions to implement them. Implementation has begun. Project outcomes are being communicated widely through a booklet, CD ROM, Website, and publications.

1. Introduction

This final report follows three Milestone Reports which covered methods and results in depth. In the sections that follow we discuss objectives and their modification, theory, stakeholders' land use visions, scenarios of sustainable futures, sustainability through institutional change, implementation and adoption, funding and publications.

2. Objectives

Original objectives were:

a). Develop a pattern of sustainable land use for a region in the Western Division, and a strategy for achieving it by:

- *explaining past and current determinants of land use;*
- *generating alternative scenarios of land use, representing the values of groups of stakeholders, and assessing their likely ecological, social and economic outcomes;*
- *finding a scenario which is both feasible, and more sustainable than the current pattern;*
- *working with stakeholder groups to reach agreement and commitment to implementing the scenario, as modified if necessary;*
- *designing the institutional and policy structures needed to support the feasible scenario;*
- *developing a phased strategy for implementation.*

b). Establish some nationally applicable principles, social processes and methods for translating broad policies on sustainable resource use into operational programs, and communicate them widely.

These objectives were modified during the project in consultation with LWRRDC. Negotiation of a single feasible scenario for our five groups of stakeholders was not attempted for three reasons. First, stakeholders did not feel they had the authority to represent their peers on a matter as important as the future use of land at a time when both pastoralists and Aboriginal peoples feel threatened by Native Title issues. Second, the development of a single scenario implies a land use zoning approach, which is unlikely to work when land use decisions are made by multiple leaseholders. A better approach is to promote institutional changes that enable a new land use pattern to emerge from those multiple decisions by changing the decision-making environment. Finally, the region is culturally diverse, and the cultures are evolving along with their values. Rather than attempt to capture a single vision that no single group espoused, we sought to develop institutions and processes within which the various stakeholder groups could continue to negotiate towards a changing pattern of land use while expressing their cultural diversity. There can be no end point in the evolution of this pattern, as cultures and visions will change. We therefore captured the values each stakeholder group currently places on land types, and expressed these as five visions that are often compatible, sometimes conflicting. The conflicts and compatibilities among land uses that emerged could then be addressed in the design of institutional changes. This approach was maintained through the

institutional change process too (Section 6), and a portfolio of institutional change was developed to promote the interests of each stakeholder group.

In a further improvement, we distinguished between stakeholders (those who have a direct interest in the land), and policy makers. Though we recognise the importance of interactions between stakeholders and policy makers in the evolution of sustainable resource use, it is the latter group that we expect to implement institutional changes that will in turn influence the pattern of land use (Section 6). Finally, while we covered the whole of the Division rather than a sub-region, our sustainability analyses are at local government level.

To the original and modified objectives we added the aim of developing and applying theory. We discuss this next.

3. Explaining the determinants of land use

To help our understanding of land use and how it might change we drew on theories of complex adaptive systems (CASs), social psychology, political economy and landscape function. The first is summarised below. All are discussed in Appendix A. CAS theory was used to organize and simplify our thinking about social-ecological interactions. It provided a framework for the disciplinary theories.

A complex system is one having multiple interacting components. An adaptive system has components that adapt to stresses. The system changes to accommodate these adaptations. Human and environmental inter-relationships involve multiple interacting components responding to changes in each other, so the system evolves over time (Gunderson and Holling 2001; Walker and Abel 2001). Components and processes are grouped within sub-systems in a hierarchy. Behaviour of a sub-system at one scale is qualitatively different from that of a sub-system at another (e.g. a property compared with a region). There are linkages across scales. A change in a broad-scale sub-system can cascade to a fine scale to affect local resource use (Gunderson and Holling, 2001). For example, the Korean War caused a demand for wool that raised the price and encouraged establishment of artificial waterpoints in previously ungrazed country. Behaviour of the finer scale sub-systems is usually controlled by influences of the broader scale ones, but change at the broad scale can be initiated by a local disturbance that transforms the regional system (e.g. disenchantment of rural voters spreading and unseating a government).

Gunderson and Holling (2001) recognise four stages of system development, which we call *monopoly*, *release*, *re-organisation*, and *growth*. Different interventions are appropriate at each stage. In the monopoly stage, system resources are controlled by large, slow variables (oligopolies, large bureaucracies, dense mature shrubs). Lack of diversity is associated with limited ability to innovate. The system is stable, but susceptible to catastrophic change in the face of external forces (e.g. globalisation, social change, wildfire). It has low “resilience” – that is, little capacity to absorb disturbance without changing to another, perhaps unwanted configuration. During the monopoly stage, catastrophic change might be avoided or deferred by deliberately allowing some disturbance – competition to oligopolies, restructuring of bureaucracies, controlled burning of a rangeland. It exposes components to sufficient stress to maintain their mechanisms of resilience (e.g. property scale drought and commodity price variation strategies), and may make it possible to avoid the next stage – release.

If monopolisation of resources is ended by a disturbance, resources become available to other processes. This is the release stage. The system is highly susceptible to change, including change to an unwanted state, and to loss of resources from the system. New opportunities arise, and innovation begins to be expressed during the re-organisation stage that follows.

Re-organisation is an opportunity for novelty, and innovations established in this stage can guide the subsequent evolution of the system. The constitutions of the Australian states are examples. Such mechanisms may persist through subsequent release and re-organisation stages and prevent a social-ecological system changing to an unwanted state. These are examples of “memory” – that is, any mechanism that maintains continuity (e. g. a law; topography in a landscape). Memory has both guiding and conservative roles, and the balance between them can be delicate. Memory can maintain resilience by guiding recovery towards a preferred state after a disturbance. In its conservative role it can also prevent adaptation and make a system more vulnerable to disturbance (e.g. laws that hamper creativity). This tends to happen in the monopoly stage.

The growth stage follows re-organisation. The system has benefited from innovations arising from release and re-organisation, and is resilient to those disturbances of which it has memory. Resilience is lost during

the ensuing monopoly stage, as once again resources are accumulated in a few controlling variables, and variety is lost.

Bio-physical systems tend to pass through these stages sequentially and thus maintain resilience through the maintenance of memory, variety and recovery mechanisms (Gunderson and Holling 2001). Human interventions, however, attempt to maintain social-ecological systems in the growth-monopoly stages because of the costs to current generations of catastrophic collapse. We use technology and fossil fuels to subsidise current activities – chaining scrub instead of resting and burning; herbicides; pumping ground water; trucking livestock. We also bring in external resources in times of crisis. We are not criticising such actions, but it is likely that in maintaining the monopoly stage we reduce resilience to disturbances, and both delay and increase the magnitude of the release stage.

The Division is in a monopoly stage. It has faced the release stage several times since the first white settlement whenever drought and low wool prices coincided. Release has been postponed each time by provision of resources from outside the Division. The Division is now characterised by administrative and legal complexity and rigidity, and land use uniformity, much of it generated during crises. Leasehold pastoralism covers some 95% of the area. Aboriginal people hold a negligible area of land, and conservation reserves cover less than 2%. The Western Lands Commission and Western Lands Act (1901) have single-mindedly guided the development of leasehold pastoralism, but are maladapted for any other purpose. Multiple layers of sectoral and environmental legislation overlie the Act (Abel and others 1999). Agencies compete for budgets and influence. Wool prices have fallen, but pastoralists are limited in their ability to adapt by restrictive lease conditions. Interest repayments are bleeding the regional economy (Figure 2, Appendix D; NIEIR, 2000). Welfare payments are the main reason smaller towns persist (NIEIR, 1999). Aboriginal people are in conflict with pastoralists as they attempt to regain access to land and water under the Native Title Act. The population is ageing and declining. Although its people are resourceful, outmoded institutions hamper their ability to adapt land uses to the challenges and opportunities climatic change and globalisation will bring.

As a first step towards institutional change we worked with stakeholders to develop their visions of sustainable land use. Recognising the institutional constraints on the Division, they were generally receptive to the project.

4. Stakeholders' land use visions for the 21st Century

Five stakeholder sectors participated in the project: Aboriginal peoples, agro-pastoral leaseholders, conservation representatives and the minerals and tourism industries. Facilitating understanding of each other's "view of the world" was a major objective in exploring conflicts. Early workshops were a vehicle for providing social interactions, building networks, communicating ideas, and teaching researchers about land use and society in the Division. Conflicts were identified, discussed and understood. Plenary and feedback discussions, shared meals and accommodation helped communication. Land uses of importance to each group were also identified.

For each land use, stakeholders developed guidelines to match land uses to land attributes (Second Milestone Report). They contributed deep and extensive knowledge to the process. The value of land for a land use was given different interpretations by the groups: suitability or profitability for agro-pastoral and tourism enterprises; probability of sites of importance to Aboriginal people; suitability for different types of conservation management; and probability of minerals exploration or mining activity in the future. Using the SIRO-MED process and WINLUPIS software, guidelines were weighted and combined for each land use to provide land value maps (Third Milestone Report). They represent a vision of how a land use and its value might be dispersed across the Division in the future, an important tool for regional planning. These maps were used to inform policy participants (Section 6) of the spatial variability of land use values.

Stakeholders used a matrix for recording mutual compatibilities of land uses (Third Milestone Report). They were asked "*Which pairs of land uses could co-exist in the same space, at the same time or sequentially, without impacting on their values and performance?*". They listed levels of compatibility - fully compatible land uses from the same sector; fully compatible land uses from different sectors; potentially compatible with negotiated conditions; incompatible; or agreement not reached on compatibility. Eighty percent were compatible, a strong indication that multiple land use is not only possible, but desired by stakeholders. This information was fed into the policy workshops (Section 6). Land use value maps can be used to identify areas where conflict is likely to be greatest due to coexistence of high values for incompatible land uses. This provides regional planners with an important tool for community consultation.

5. Scenarios of sustainable futures

We developed with the National Institute for Economic and Industry Research and the Western Lands Review a set of social and economic scenarios for the Division (NIEIR 1999). The scenarios are: continuation of the present arrangements; increase in agriculture; increase in government spending in the Division (including nature conservation); increase in mining; increase in tourism.

Methods and some results, including social and economic consequences, were in the Third Milestone Report. Appendix B of this report summarises bio-physical consequences not previously presented.

6. Sustainability through institutional change

Policy makers from 50 organisations participated in institutional change workshops. They were exposed to resilience theory and systems analysis, and these principles of regional sustainability:

- *humans are part of nature, adaptive agents in a CAS, not external controllers of a bio-physical system (Gunderson et al., 1995);*
- *even in the social part of the system “no-one is in charge” – governments do not lead us, they are driven by competing pressures from voters, interest groups and party funders (Appendix A);*
- *institutions should be designed to allow just enough disturbance to maintain resilience; they should allow just enough external support to prevent a system crash, but without discouraging internal adaptation;*
- *organisational memory is necessary to guide regions through recovery following disturbance, just as land managers’ memories guide recovery at local scale;*
- *capacity for learning from past disturbances must be built and maintained in land managers and in organisations, thus enhancing the ability to anticipate and adapt to future disturbances;*
- *innovation and diversity should be fostered within societies and land use to provide a wide range of options when conditions change;*
- *we should accept a level of redundancy in infrastructure, technology and institutions - if part fails there are backups.*

These principles are implicit in some of the proposals for institutional change (Appendix C). Participants developed the PIMWEST model of the influence of laws, policy, economy, society and environment on land uses across the Division (Second Milestone Report). Relationships among factors were extracted as causal trees showing the influences that enhance or hinder the land use interests of each sector. These were refined during the workshops and participants began to propose institutional changes to enhance the interests of each sector, minimise conflict and complexity and promote resilience. Outputs from the stakeholder process were used to seed ideas for change, for example towards multiple land use. Participants developed five portfolios for institutional change, one for each stakeholder sector. Additional proposals were developed by the research team to promote unconventional changes that might enhance outcomes for all sectors (Appendix C). Summaries follow.

Aboriginal portfolio

Increase Aboriginal influence on regional planning and development through: recognition of customary law; and increased Aboriginal representation on planning and decision-making bodies.

Resolve conflict between Aboriginal peoples and landholders through: changes in Native Title law; Indigenous Land Use Agreements (ILUAs); co-management of pastoral leases; and better representation of Aboriginal people with local connections to land.

Resolve conflicts among Aboriginal peoples through: ILUAs; changes in Land Rights and Native Title law; and recognition of tribal areas.

Increase Aboriginal ownership or control of land and water through: lease purchases; co-management of more National Parks and reserves; and allocation of water rights.

Enhance Aboriginal access to land and water through: ILUAs; changes to access and liability law; access agreements; and recognition of traditional rights to hunt and fish.

Improve protection of Aboriginal cultural sites by: changes to National Parks and Wildlife Act and Environmental Planning and Assessment Act; and through Aboriginal heritage management agreements.

Agro-pastoral portfolio

Promote diversification of land uses through: rebuilding extension services; adding aquaculture extension; easing restrictions where land is capable of more intensive uses; “one-stop-shop” development approval; production cooperatives; giving timber rights to leaseholders; and stewardship payments for conservation.

Increase investment at property level by enhancing security of tenure and freeholding of leases.

Eliminate debt by property amalgamation and other measures.

Improve roads by establishing a legal road network, and resolving trespass and liability issues.

Promote sustainable management of land by: amending land law so it specifies lessee’s rights and responsibilities, management outcomes, voluntary nature conservation agreements, incentives, and periodic changes of lease conditions.

Nature conservation portfolio

Promote sustainable use of natural resources across the region through: 1) legislation that sets strategic social, environmental and economic outcomes; establishes natural resource policies, plans and programs; integrates natural resource and catchment management policies; sets out rights and obligations of resource users, environmental controls and incentives; and establishes participatory planning processes; 2) taxation, grant, user-pays, and incentive measures; 3) linking restructuring policy to land suitability and conservation value; 4) better representation of conservation interests on advisory committees; 5) incentives and levies on uncapped bores; selective removal of water licenses; 6) formal land condition and trend reports required when a lease is sold.

Establish a comprehensive, adequate and representative reserve system (CAR) by: formalising a policy under the law; acquiring public reserves and encouraging conservation on private land through taxes, rents and stewardship payments; linking the CAR to the Conservation Trust; biodiversity accreditation linking consumers, retailers and producers; a biodiversity credits scheme; debt-for-conservation swaps; conservation on leases purchased by mining companies to get water rights.

Clarify the priorities of National Parks and Public Reserves: conservation of native biodiversity should be first, conservation of heritage second, and public enjoyment the third priority.

Minerals industry portfolio

Improve participatory planning by better representation of stakeholder interests on permanent advisory committees.

Promote regional development through: favouring approvals for value-adding development projects; a simplified and improved development approval process; tax incentives for new mines and for employment of local people.

Improve rehabilitation by setting the level of the post-mining land rehabilitation bond according to past record of the company.

Promote multiple and sequential land use through: State Conservation Reserves that contribute to a CAR reserve system, but where exploration and mining are allowed; and a development approval process that favours multiple and sequential use.

Promote efficient water use through: user charges; water trading; incentives for water exploration; and review of current water licenses.

Tourist industry portfolio

Expand the tourism industry in the region while maintaining quality by: developing a carrying capacity strategy and the means of implementation; supporting the establishment of a CAR reserve system; and accreditation of operators.

In addition to these institutional changes the tourism representatives proposed improvements to roads, communications, transport and accommodation; Aboriginal cultural tourism; and development of eco-tourism.

Researchers' proposal for restructuring regional organisations

State agency, local government and community committee arrangements are complex, over-redundant and often unconnected. Simplification is needed. To encourage policy makers to think beyond current arrangements, researchers proposed incorporation of community-based resource management committees and local governments with the existing catchment management boards to form two Regional Councils. The Councils would co-ordinate strategic socio-economic and natural resource planning for the region. They would undertake development approvals, collect rates and provide traditional local government services. Local representatives would be included in many of the functions currently provided by resource management committees. Relevant state agencies would staff the technical and regulatory sections of the Councils, with appropriate transfers of those agencies' budgets to the Councils.

7. Strategies for implementation and adoption

“Mental model” theory (Appendix A) explains why humans will not readily accept change on the basis of spoken or written information alone, especially if it threatens their own interests. They need experiences that are convincing, and opportunities to analyse new propositions deeply. We designed stakeholder and institutional change workshops to provide these experiences and opportunities. We assumed that if a sufficient number of policy makers at sufficiently high levels attended our series of workshops, they would become champions for change. We have been in contact with 150 policy makers, and over 60 attended our last policy workshop. While this has made us optimistic about change in the medium term, short-term prospects remain uncertain. One reason is the Western Lands Review (WLR).

The WLR began after this project and finished beforehand. Its objectives were similar, though narrower and shorter term. Because it was a Parliamentary commission it had higher official status than our project. With the agreement of our stakeholders we therefore offered project information to the WLR. We also contributed to two of the five consultancy reports (Abel et al 1999, Baker et al 1999), and co-funded and helped write terms of reference for a third (NIEIR 1999). The commissioner and his assistant participated in our policy workshops, and outputs were submitted formally to the WLR. In general we (the researchers) support the recommendations of the WLR, and these are mirrored in our own recommendations. We have other recommendations that are not reflected in the WLR report, and these are more radical than the WLR was allowed to propose.

Reaction against the WLR by pastoralists in the Division was strong. Recommendations have not progressed beyond the Ministers’ office. We have kept our project on hold in the hope that decisions would be made, and we could activate our champions. But water reforms have stolen the political agenda, and little will happen before mid 2001. Meanwhile we provide planning support for the Catchment Management Boards and West 2000 Plus.

The main method of communication and adoption is through our policy-maker and stakeholder network. They have been receiving our Newsletters. We now have a booklet (Appendix F). The Website is under construction. It will be emulated in a CD-ROM for stakeholders with restricted Internet access. Stakeholders and policy makers will be well equipped to re-activate networks when Parliament responds to the WLR.

The Catchment Management Boards were our community sponsors for the funding application. We have built strong links through our workshops. They are now preparing catchment plans to which we are contributing ideas, information and outputs from this project, including the design of a comprehensive, adequate and representative conservation reserve system (CAR) (Appendix D). We are also working with West 2000 Plus, AFFA, NPWS, WWF and National Parks Association to develop a pilot stewardship scheme that would complement the CAR (Appendix D). Representatives of these organisations were among our stakeholders and policy makers.

In summary, we will continue to support the Catchment Management Boards and West 2000 Plus, maintain the Website for a few years, and will draw on Appendix C and our networks when NSW Parliament makes a move. Meanwhile the portfolios of institutional change will remain accessible to champions that wish to promote the interests of a group.

We are also communicating to researchers and regional planners through the literature. To the articles listed in Section 9 we will add four journal papers and a book chapter in 2001.

8. Acknowledgements

We are deeply grateful to our stakeholders and policy-makers for providing the foundations for the project. We are also indebted to these people for their support and ideas: Phil Price, Brian Walker, Buzz Holling, Richard Dunworth, David Farrier, Mandy Yialeloglou, Nick Nicholls, Ross O’Shea, Steve Orr, Tim Ferraro, Brendon Baker, Margaret Cawsey, Guy Barnett, Bob Pressey, Mike Fleming, Carla Mooney, Peter Walker, Cathy Mobbs, Terry Mazzer, David Tongway, Ken Hodgkinson, Richard Price, Steve Morton, Dick Condon, Guy Fitzhardinge, Dee Murdoch, Jen Shearing, Vanessa Chewings, Dennis Barber, John Carter and Monica van Wesween. Community sponsors were the Western and the Lower Murray Darling Catchment Management Committees, (now Boards), respective chairs Jenny McLellan and Ron Rees. The work was funded by CSIRO Sustainable Ecosystems, Land and Water Australia, and the NSW Department of Land and Water Conservation.

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