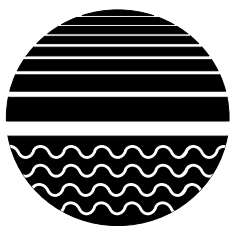


Regional Resource Use Planning in Rangelands: an Australian Review



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August 1998

Foreword

Australia's rangelands, which may be defined as 'areas where domestic stock are grazed on native pastures', represent about 55% of the country's land area, and encompass a wide range of climates, soils, vegetation and land uses. Much attention has been directed to understanding biophysical aspects of rangeland ecosystems, particularly in relation to grazing, the most widespread land use. More recently, attention has also focused on the conservation of biodiversity throughout the rangelands, and to the economic and social sustainability of rangeland communities.

Our rangelands have witnessed periods of intense pressure and change. These have left their marks on the landscape and its vegetation. Introduction of sheep and cattle, extension of watering systems, and the effects of a highly-variable climate were early stressors. Mining has long been a very important activity in the rangelands. Tourism and the return of management of land and water resources to Aboriginal people are more recent developments. Though dealing with many of these changes has been a challenge, they have also presented opportunities. Nevertheless, the need remains to resolve conflict between different land uses, to maintain a sustainable grazing industry in the face of increasing costs and falling prices, and to preserve the social fabric of the rangelands in the face of technological and economic change.

One of twenty or so national R&D priorities identified by LWRRDC during an extensive process of review and consultation following its establishment was:

Maintenance of condition, productive capacity and environmental values of Australia's rangelands.

In October 1993, in collaboration with the CSIRO Wildlife and Ecology, the Corporation held a national workshop to identify R&D priorities for sustainable use and management of Australia's rangelands. A full report of that workshop is available in LWRRDC Occasional Paper 06/93.

The workshop brought together people with a wide range of views and expertise in rangelands

management. Seven categories of R&D priorities and four broad, cross-cutting themes were identified. Two of the themes were that:

- socioeconomic aspects of rangeland management consistently emerge as an area of vital importance, associated with the capacity and processes needed to enable those living in the rangelands to consider opportunities for their own future; and
- although a national framework could provide benefits for the effective and consistent management of the rangelands, priorities need to be addressed in more detail and at the level of individual regions, so as to take account of the differences in climate, soils and landscapes across the rangelands as a whole.

Following that workshop, LWRRDC sought to establish, in collaboration with rangeland communities and research organisations, a group of projects that would integrate research and information generation with a regional resource planning process. Our aim was to bridge the gap between research activities and the processes by which decisions are made on resource allocation and use. We also wanted to establish an interactive process that brought together the experience of rangeland communities with the knowledge and expertise of researchers and other specialists.

Three such projects are now under way: in the North-East Goldfields region of Western Australia; in the Western Division of New South Wales; and in the Central Highlands of Queensland. The third project has a particularly strong focus on examining and supporting the process of regional resource planning. As part of the development of that project, its principal investigators and associates undertook a review of past efforts in regional resource use planning, with particular reference to the rangelands.

Until now, there has been little attempt to formally evaluate regional resource planning projects. This review finds that many of the past projects have not met important criteria for success. In some cases, the project and the planning have been centralised, with limited local participation, and hence low likelihood

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of results being implemented. Several projects have focused only on a subset of economic, environmental or social issues, and have therefore not yielded the type of integrated outcome that communities seek. Many past projects have gathered much information, but have failed to apply it to practical issues in resource use and management. In nearly every case, there has been little serious effort to identify and involve all stakeholders, or to resolve conflicts between their interests. As a result of these shortcomings, past planning projects have generally failed to reach binding agreements through which improved decisions in resource use and management could be implemented. Few of the projects have done

much to empower regional communities to carry on the process themselves and to make decisions about their own futures.

The authors of this report draw out many of the requirements for successful regional resource use planning. Although the report focuses on rangeland resources, its findings and recommendations will be of widespread interest to any group or individual concerned with progress towards the goal of ecologically sustainable development.

Phil Price
Executive Director, LWRRDC

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Notes on Contributors

To undertake this review, CSIRO assembled a multi-disciplinary team with expertise in regional aspects of land and natural resource management. This team included people with a professional background in rangelands ecology, resource economics, regional resource use planning, social planning, information technology and geographic information systems. While many individuals and organisations have contributed to its content, the review has been written as an integrated document, both for ease of reading and to ensure consistency in the way that ideas and techniques are presented and analysed. We hope that it brings together a breadth of views and perspectives that are rarely integrated effectively in resource use planning practice.

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Allan Dale has extensive experience in natural resource planning and impact assessment, having worked in the field as an academic, a consultant and in the Queensland government. He is currently leading a regional resource use planning R&D project in Queensland's rangelands (Central Highlands Regional Resource Use Planning Project). Apart from his editorial role, Allan contributed to the overall structure of this review and sections relating to regional social assessment.

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Jennifer Bellamy is a natural resource scientist with extensive experience in research on decision support for natural resource management and land use planning. She also has been involved in the evaluation of integrated approaches to the management of natural resources. She is currently involved in research within the Central Highlands Regional Resource Use Planning Project. In addition to her editorial role, Jennifer predominantly contributed to the background of this review and to the sections relating to information technologies and regional environmental assessment.

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Duncan Lowes is experienced in the application of information technologies and decision support systems to natural resource management. At the time of writing, he was integrating information technologies into communication mechanisms within the Central Highlands Regional Resource Use Planning Project and was refining a decision support system designed to assist rangeland producers to assess the risk of management decisions to pasture sustainability. Duncan reviewed the use of information technologies in regional resource use planning as background to this review.

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Stuart Cowell has previously worked in the forestry and mining industries and for Aboriginal land councils in rangeland environments. He has recently completed his honours thesis on regional aspects of decision-making in the mining industry in the Gulf of Carpentaria. In this review, Stuart undertook much of the background research concerning institutional arrangements for regional planning and coordinated the development of the case studies.

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Cathy Howlett has previously worked as a researcher in regional planning and has recently completed her honours thesis—an evaluation of the CYPLUS process from an organisational theory perspective. She is currently lecturing in social anthropology in Griffith University’s School of Environmental Sciences. Cathy contributed the CYPLUS case study to the review.

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Alf Said has had extensive experience as a forest resource planner in Queensland’s Department of Natural Resources. Until recently, Alf was manager of the comprehensive regional assessment (CRA) team facilitating the regional forest agreement (RFA) process in south-eastern Queensland. Alf contributed the CRA case study to the review.

Other contributions

Significant intellectual contributions to this Review were also made by Dr Dan Shrubsole (University of Western Ontario, Canada) and Dr Dick Birnie (McCauley Land Use Research Institute, United Kingdom). As author of a companion review concerning indicators of sustainability in regional rangeland management, Dr Sue McIntyre (Senior Research Scientist, CSIRO Tropical Agriculture) also played an important role. Carl Smith (Department of Geographical Sciences and Planning at Queensland University) provided a review of integrated land evaluation procedures. Review maps were compiled by Luis Laredo and references collated by Marianne Wright, CSIRO Tropical Agriculture.

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Acronyms and Abbreviations

AAP	Area Assistance Program	IGAE	Intergovernmental Agreement on the Environment
ACF	Australian Conservation Foundation	ILAP	Integrated Local Area Planning
ALGA	Australian Local Government Association	ILIM	Indigenous Land Interest Model
ASTEC	Australian Science and Technology Council	IT	Information Technology(ies)
ATSIC	Aboriginal and Torres Strait Islander Commission	LWRRDC	Land and Water Resources Research and Development Corporation
CALM	WA and NSW Conservation and Land Management Agencies	MDBC	Murray–Darling Basin Commission
CBA	Cost Benefit Analysis	NABRC	North Australia Beef Research Council
CORE	Commission on Resources and Environment (British Columbia)	NFF	National Farmers’ Federation
CRA	Comprehensive Regional Assessment Process	NLMP	National Land Management Program
CRC	Cooperative Research Centre	NRAP	CYPLUS Natural Resource Analysis Program
CSIRO	Commonwealth Scientific Industrial Research Organisation	NSCP	National Soil Conservation Program
CYPLUS	Cape York Land Use Strategy	OMNR	Ontario Ministry of Natural Resources
CYRAG	Cape York Regional Advisory Group	PSR	Pressure–State–Response
DEETYA	Commonwealth Department of Employment, Education, Training and Youth Affairs	RAC	Resources Assessment Commission
DEST	Commonwealth Department of Environment, Sport and Territories	R&D	Research and Development
DHARD	Commonwealth Department of Housing and Regional Development	RDP	Regional Development Program
DPIE	Commonwealth Department of Primary Industries and Energy	REDO	Regional Economic Development Organisation
DSS	Decision Support Systems	REEP	Commonwealth Regional Environmental Employment Program
ESD	Ecologically Sustainable Development	RES	Regional Environmental Strategies
GIS	Geographic Information System(s)	RFGM	Regional Framework for Growth Management
GLADA	Gulf Regional Local Authorities Development Association	RFA	Regional Forest Agreement
GBRMPA	Great Barrier Reef Marine Park Authority	RMA	New Zealand Resource Management Act
IBRA	Interim Biogeographic Regionalisation of Australia	RMWA	River Murray Waters Agreement
		RPAG	Regional Planning Advisory Group/Committee
		SoE	State of the Environment
		UN	United Nations
		VROC	Voluntary Regional Organisation of Councils
		WTMA	Wet Tropics Management Authority

Executive Summary

Both scientific evidence and national debate indicate that Australia's rangelands are in stress. In many rangeland regions, land degradation and farm debt are increasing while community populations and social support services are declining. Conflicting pressures to jump at every economic opportunity, to shift to sustainable production systems and to reconcile the past displacement of indigenous people have set a rapid pace of change for people in rangelands.

To address these pressures, solutions based on regional, integrated, ecosystem approaches to planning are frequently promoted. Calls for such approaches have come from many sources, including international bodies, Commonwealth and State government agencies, industry sectors and community-based stakeholder groups, but there remains a wide divergence of views about how they might be achieved. Few groups can agree on what is sustainable and equitable, let alone what constitutes an effective regional approach to resource use planning in rangeland environments. The challenge is to establish planning systems that can deliver on the ideas and rhetoric.

This review looks critically at past and contemporary approaches to regional resource use planning in Australia and overseas, with the view to charting a course for more effective planning in Australian rangelands in the future. It suggests that, to deliver effective outcomes, regional resource use planning must encourage and implement approaches that facilitate equitable negotiations among regional stakeholders. This requires regional resource use planning that incorporates at least three primary elements: (i) the application of technically sound and innovative social, economic and environmental assessment methods to underpin negotiations; (ii) the establishment and maintenance of appropriate institutional and support arrangements to facilitate negotiation; and (iii) clear mechanisms to enhance the participation in negotiations of as many as possible of the constituents of the stakeholder groups represented in the regional planning arena.

With these elements in mind, this review shows that regional approaches to resource use planning are not new in Australia. Indeed, there is a wealth of institutional arrangements in place to encourage regional approaches. Nevertheless, grave deficiencies

can be seen in current practices and arrangements when they are viewed against the core regional planning elements and measures of accountability, efficiency, effectiveness and equity. Most current activities are largely centralised planning processes that have focused on non-integrated themes of economic or social development, or conservation in protected areas. Moreover, there have been few formal evaluations of these practices and arrangements and little adaptive management. There remains a pressing need for R&D to focus on evaluating the strengths and weaknesses of our regional resource use planning systems in ways which facilitate and underpin appropriate reforms.

In relation to technical aspects of regional resource use planning, this review finds that information technologies have been overused for spatial representation and data management, and underused for interpretive analysis and as tools to assist negotiation. It also reveals a need for an improved understanding of the social, cultural and ecological processes that underpin the way regions function, to give a better understanding of the relationship between human service delivery, economic efficiency and sustainable management. Regional aspects of economic assessment need further refinement, with a greater focus on sectoral viability, more robust systems for valuing economic resources and stronger systems-based approaches to economic modelling which can be applied effectively across spatial and temporal scales.

The focus of planning has often been on the development of regional structure plans used by central authorities to regulate land use, rather than to help negotiate solutions to the conflicting interests of regional stakeholders. Consequently, such planning has generally been ineffective in either reaching binding agreements between stakeholders or in managing conflict when development proposals are presented for assessment by regulatory agencies.

The current institutional arrangements for regional planning often entrench inequities. In other situations, more flexible institutional arrangements support negotiatory processes in principle, but do not taking full advantage of the legal and political opportunities for negotiation. Effective monitoring and evaluation regimes that continue to build the negotiatory spirit

among key stakeholder groups once initial regional planning has been completed are rarely put into place. Substantial R&D effort is needed to define more effective institutional arrangements and conditions for facilitating negotiations that will result in binding stakeholder agreement over regional aspects of resource management. There is a need to redefine the organisational context within which regional planning occurs, so as to establish mechanisms for negotiation that are on the one hand equitable and on the other meet the needs of government-based planning agencies.

This review finds that while most regional resource use planning activities expound and practice various forms of consultation with the general community, few have been committed to giving stakeholder groups the power to make decisions. This must change if agreements negotiated at the regional level

are to be credible and durable, and if support for change towards sustainable resource management systems within regions is to grow. Particular emphasis needs to be placed on improving mechanisms (eg., participant funding, etc.) for resourcing stakeholder groups to carry out representative functions, and on developing improved techniques to empower individuals and groups to develop their own planning and negotiation skills.

This review explores some of the more innovative techniques and procedures that can be used to improve regional resource use planning outcomes in rangelands. It also recommends what sorts of R&D are needed to enhance the effectiveness of regional approaches. New attempts to deal with regional issues in rangelands must learn from the successes and failures of previous regional planning experiments in Australia and elsewhere.

1 Regional Resource Use Planning: Review Introduction

This review presents a comprehensive description and analysis of current trends, practices and R&D priorities in regional resource use planning. It canvasses these issues at the international level, focuses on national considerations, and pays particular attention to the potential application of the findings to Australian rangeland environments. The review underpins a new regional resource use planning R&D initiative that is currently being tested within Queensland's rangelands. It is also linked to a concurrent review of the impact of grazing management practices upon ecosystem functioning and bio-diversity in rangelands. While this review focuses on regional planning in rangelands, its findings are broadly applicable to rural environments across Australia.

In this chapter, we introduce the purpose of the review by briefly examining the reasons why integrated regional approaches to rangeland management are currently receiving much attention in the academic literature and in contemporary policy debates. These include factors such as the long-term political impact of social conflict, economic uncertainty and resource degradation problems in rangeland environments. We also outline how growing national, regional and global political support for sustainable development has encouraged talk of the need for more integrated regional approaches to rangeland management.

In the light of these political pressures for regional approaches to rangeland management, we spell out the objectives of the review in this chapter. We then outline how this review is structured to address these objectives. In doing so, we hope to make it useful to scientists, planners and rangeland stakeholders. To place the review in context, we then go on to characterise Australian rangelands and to explore a range of issues that is currently posing challenges and opportunities for their sustainable management. We also explore the highly contested concept of 'region' and provide guidance on how on it can be successfully accommodated within resource use planning practice.

1.1 Why Regional Resource Use Planning in Rangelands?

The last two decades have seen a remarkable worldwide recognition of the increasing pressures on our natural resources. This has emerged amidst trends toward greater diversification in the use of, and values placed upon, natural resource systems. It has also evolved at a time of greater calls from the community for public involvement in decision-making, and for higher standards of accountability in environmental protection. There is also increasing scientific recognition of the complexities of ecological processes and that economic decisions cannot be separated from their social and ecological consequences. International acceptance of a need for action on a societal scale and within limited time frames is evolving rapidly (eg. Functowicz and Ravetz 1990; Jiggins 1995)

Together, these factors are forcing revision of the pre-eminent paradigm relating to natural resource use and management. The traditional paradigm has been characterised by the so-called rational, scientific model of sustained yield, which has focused on, for example, optimising on-site production, and maximising consumptive resource use (eg. Cortner and Moote 1994; Boehmer-Christiansen 1994). The emerging paradigm is based on integrated ecosystems management and collaborative decision-making (Cortner and Moote 1994). It emphasises two core principles: (i) maintenance or restoration of resource condition or health (eg. ecological state) and long-term resource sustainability; and (ii) the reconciliation—through structured and equitable mechanisms of bargaining and negotiation—of conflicting values, interests and expectations of different stakeholders involved in the use and management of resources (eg. Boehmer-Christiansen 1994).

The complexities and interrelatedness of the environmental, economic and social aspects of resource use over time and space have been well recognised in international agreements

(see Section 4.1). An outcome in Australia has been that approaches and attitudes to natural resource management in rangelands are increasingly being shaped by major national goals and policies (see Section 4.2). Decision-making and action relating to the use and management of land and water resources, however, occurs largely at the individual land manager level. Collectively, at the regional or catchment level, such decisions and actions may have significance and offsite implications for ecosystems and social communities, as well as for future resource uses and functions. For these reasons, resource use and management trade offs between economic and productive use, conservation, and the social and cultural values of land need to be assessed and resolved in a regional context. Regional approaches to resource use planning present an opportunity to ensure that sustainable development can occur without inequitable outcomes for producers, industry and community-based interests groups, both now, and for future generations (ie., intra and inter-generational equity can be assured).

The need for regional approaches to resource use and management is particularly apparent within Australian rangelands, given the contemporary problems they face (see Section 1.2). As a result, the call for regionally-based, integrated and ecosystem approaches is becoming stronger (eg. Morton and Price 1994; Wilcox and Cunningham 1994; Robertson 1994; Stafford Smith 1994; Holmes 1994, 1996c; Walker 1996; Hoey 1996). Despite this, however, there is no generally agreed body of guiding principles, procedures and techniques for the application of such approaches which can integrate ecological and equity issues. This is still the case regardless of the long history of regional planning activities across Australia.

Because of the significance of the land degradation issues facing Australian rangelands, the Land and Water Resources Research and Development Corporation (LWRRDC) held a national workshop in Brisbane in October 1993 to identify R&D priorities for their sustainable use and management (Morton and Price 1994). The workshop identified regional analysis and planning to be of vital importance to the future of rangelands. The participants also identified a number of related R&D priorities, including:

- the need to link rangelands R&D to regional planning in order to promote application of new knowledge;
- the development of effective methods of bridging gaps in information between economic production

and ecological sustainability, in order to assist in land use and management decisions; and

- the development of mechanisms for identifying all interest groups in order to ensure that regional planning is responsive to the full range of community interests.

Following initial discussions between LWRRDC and CSIRO Tropical Agriculture, a broad agreement was reached to establish and fund a new regional resource use planning R&D project for the Queensland rangelands. The project would have two key objectives:

1. to collaboratively develop and apply an improved planning framework for evaluating the use of natural resources at a regional level;
2. to undertake more detailed examination of the interrelationships between productivity and sustainability in livestock production systems.

This review was instigated to underpin the development of an R&D project (the Central Highlands Regional Resource Use Planning Project) to explore the first of these objectives. It is envisaged that this project will result in the development and application of guiding principles, practices and techniques for natural resource use decision-making in a regional context. While the work will be based on a Queensland case study, it is anticipated that the outcomes will have general application across Australian rangelands and other rural environments. The R&D will take a multidisciplinary approach to assess and integrate information on the biophysical, economic, social and policy aspects of resource use. It will also have a strong emphasis on direct stakeholder involvement in developing and negotiating appropriate regional land-use strategies. Queensland's Central Highlands project was intended to complement two companion research projects in Western Australian and New South Wales' rangelands (see Section 4.3).

The second of the above objectives was explored in another review (see MacIntyre and McIvor 1998) which ran concurrently with the one reported here.

As regional planning has not been a basic component of rangelands management in Australia, our review seeks to cast a wide net; exploring international, national, interstate and cross regional experiences and drawing particularly upon those lessons that can be transferred and applied in a rangelands context.

1.1.1 Objectives and structure of the review

In undertaking the review, we have aimed to produce a document that not only will underpin our evolving R&D project, but also will provide a useful tool to all planners, scientists and stakeholders with an interest in regional planning. Thus, the review seeks to meet the following objectives:

1. to determine whether there is strong political support, practical need and demand for regional approaches to resource use planning in Australia;
2. to establish a clear understanding of the essential elements of regional resource use planning and a set of baseline principles that should apply if such planning is to meet the current challenges facing rangelands;
3. to map out the complexity of institutional arrangements that are already in place to support approaches to regional resource use planning in Australia;
4. to assess the current state of regional resource use planning and its associated institutional arrangements in Australia and overseas against the baseline principles developed;
5. to identify innovative procedures and techniques that might be applied to regional resource use planning to meet the baseline principles established; and
6. to explore R&D priorities for improving regional resource use planning practice in Australian rangelands.

The review is structured around these core objectives. In Chapter 2, we look, from the national to the regional level, at political and academic pronouncements that have supported regional approaches to resource use planning. We explore the diversity of views across those stakeholder groups with an interest in rangelands. We also seek to determine whether this support has been consistent across biogeographic zones and resource sectors within Australia. In doing so, we determine whether or not rangelands are a special case, or whether lessons can be drawn from regional resource use planning as it applies to other spatial and sectoral resource zones.

In Chapter 3, we summarise the literature on the theory of regional resource use planning. We determine the core elements of regional planning and develop some key principles that can be applied if such planning is to meet the political expectations that have been set for it. In an attempt to better conceptualise the way that planning operates, we

have divided the literature into three core elements, while seeking to maintain an overall perspective on the integrated nature of resource use planning problems. Based on an analysis of contemporary developments in planning theory, these broad areas include: (i) the integrated application of technical assessment procedures and methods within planning, including the use of information technologies; (ii) the facilitation and institutionalisation of equitable negotiations among stakeholders with an interest in land use; and (iii) issues relating to the participation of constituent members within stakeholder groups involved in negotiations over regional aspects of natural resource management.

With a clear set of principles established, we then review, in Chapter 4, the institutional arrangements that already support regional resource use planning across Australia. We also compare these to the institutional arrangements in a few other developed countries. Chapter 4 therefore provides a basis for a broad analysis of how Australian regional resource use planning measures up to the key principles identified in Chapter 3. We undertake this analysis in Chapter 5.

Armed with a clear understanding of the limitations and strengths of our current regional planning systems from Chapter 5, we take a closer look at the literature in Chapter 6 to present a number of newer procedures and techniques that we consider may help to bridge gaps between current deficiencies and best practice. This may provide a basic toolkit for individuals and groups interested in improving planning outcomes. We also recognise, however, that some techniques and procedures need further development if current practice is to improve. Thus, in Chapter 7, we broadly identify those R&D priorities needed to improve planning practice, so as to enable it to offer equitable and sustainable solutions and options to rangelands managers.

1.2 Why Rangelands? Their Characteristics and Contemporary Issues

In the rest of this chapter, we explore further why regional approaches to resource management should be applied in rangelands. What are rangelands, and what characteristics make them amenable to regional planning? We also explore what we mean by a 'region' and how the concept can be applied to rangelands.

1.2.1 Defining rangelands

The Draft National Strategy for Rangeland Management (NRMWG 1996) defines rangelands as follows:

Australia's rangelands are made up of native grasslands, shrublands and woodlands, the tropical savanna woodlands, and the slopes and plains of northern New South Wales (NSW) and southern Queensland... They are characterised by unique geological formations, diverse landscapes, and a rich heritage of culture and tradition (NRMWG 1996:1).

This definition excludes parts of the tropical and subtropical savannas of central and eastern Queensland (Mott et al. 1985) where climatic, soil and economic conditions have enabled the "naturalisation of, or purposeful incorporation of, improved pasture species" (Mott and Tothill 1984). In these areas, animal production is still predominantly based on natural pastures under extensive management systems. Thus, for the purposes of this review, we have broadened the definition of rangelands to include all of the eastern tropical and subtropical savannas. Rangelands are defined, therefore, as areas where domestic stock grazing on natural pastures is the predominant land use.

According to this definition, rangelands encompass over three-quarters of the Australian continent but only about 2% of the nation's population occupy them (Stafford Smith 1994). They are very diverse in terms of their geomorphological, ecological, economic, social, cultural and institutional characteristics:

Australia's rangelands are vast and biogeographically diverse. Complexity arising from diversity in ecology and productivity is further enhanced by divergent histories in land settlement; by differences in State/Territory administrative, political and demographic forces and by differences in the relative location and significance of rangelands within their boundaries; by differential impacts of regional accessibility and infrastructure; and by divergent opportunities for non-pastoral use (Holmes 1994:39).

The major land uses in Australian rangelands include extensive pastoralism (60%), Aboriginal lands (15%), conservation (4%), and small areas of mining, tourism, and military activity (Stafford Smith 1994). There may also be areas of cropping, either for fodder or commercial production.

1.2.2 Stakeholders in the rangelands

Addressing issues such as the sustainable use and management of our rangelands requires the collective

action of a broad and diverse group of stakeholders, including:

- individual resource users (eg. pastoralists, miners, Aboriginal people, tourists);
- policy, planning, regulatory and advisory agencies within all three spheres of government;
- producer, resource user and community groups (eg. Landcare and Integrated Catchment Management groups, producer organisations, conservation agencies; Aboriginal groups);
- R&D and extension providers (eg. in research institutions, universities and government agencies).

This diversity will underpin any regional resource use planning project dealing with sustainability in rangelands, particularly in respect of negotiated approaches to design and implementation.

1.2.3 Pressures facing rangelands

Recent assessments of rangelands have indicated widespread deterioration in most pasture types in many areas as a result of reduced rainfall, a substantial build-up of livestock numbers since the 1960s and changes in husbandry (eg. Tothill and Gillies 1992). There are also concerns about loss of valued habitats, threats to native species, declining economic viability, and an increasing dependence on public support, not only to provide relief in times of economic crisis, but also to maintain basic services to highly dispersed populations (Holmes 1994; Vanclay and Lawrence 1995). Pest animals (eg. rabbits, goats and pigs) and weeds (eg. prickly acacia and rubber vine) are also affecting productivity and ecological sustainability (Maconochie 1996).

A recent study of economic viability in the rangelands found that declining terms of trade for producers and land degradation were affecting the economic viability of pastoral production in many areas, increasing public concern for rangeland habitats and creating a need for restructure. Beare et al. (1995a) warned that, because rangeland producers have limited opportunities to diversify production or to alter production systems, restructuring pastoral enterprises was likely to be a long, slow process. There is also evidence of land use conflict and social decline within the rangelands (eg. see Holmes 1996 and Vanclay and Lawrence 1995).

Australian rangelands are undergoing changes in resource values and uses, land ownership, economic direction, political and economic power structures, and cultural and ethnic diversity (Holmes 1996b; Maconochie 1996). These changes involve a

fundamental shift in the predominant resource use paradigm for rangelands, from commodity-orientated goals of production, to new, more holistic goals, including ecologically sustainable development, the preservation of biodiversity, novel modes of non-consumptive or low-impact resource use, recreation, tourism, and the pursuit of social justice, cultural traditions and self determination (Holmes 1996b). It needs to be remembered, however, that (Walker 1996:5):

Resolving the complex issues required for sustainable habitation in the rangelands will not be achieved by reductionist studies of the ecology of rangeland vegetation, or efficiency of animal productivity, or of industry economics, or other topics analysed in isolation. It requires an integration of ecological, economic and social issues at local (paddock to property), regional and national scales.

.... The significance of any one of these issues can only be assessed by determining how it is influenced by, and how it influences, the other issues, at other time and space scales.

Some key issues relevant to the regional context are summarised in Table 1, in terms of the potential causes and possible impacts at the enterprise or regional levels.

1.2.4 New opportunities in rangelands

In the last two decades, there has been a shift in national perceptions and aspirations concerning the rangelands. This has been accompanied by a general shift from the pre-eminence of pastoralism as the dominant resource use, to increasing recognition of the significant opportunities for diversification and new land-use alternatives (eg. Holmes 1994; Morton and Price 1994). Holmes (1994) identifies five distinct stakeholder imperatives shaping the future use of rangelands:

- preservation of biodiversity, with a growing emphasis on preserving valued ecosystems in near-pristine condition;
- pursuit of ecologically sustainable land use, commensurate with biological productivity;
- application of an economically optimal mix of land uses, while ensuring these support economically viable enterprises;
- pursuit of equitable outcomes, particularly in regard to the rights and needs of Aboriginal people; and
- facilitating land use change, particularly by minimising impediments to land use conversion

to more intensive uses or to uses for public purposes.

The major alternatives to pastoralism include different models of land use which meet needs for: Aboriginal access to land; conservation reserves; public access for diverse tourism and recreational activities; harvesting of wild flora and fauna products; military activities and mining (Holmes 1994; Ash 1996; NRMWG 1996). In a number of cases, however, there is conflict and competition among existing and potential future land uses. As Robertson (1994) notes, rangelands are at a critical point in time, and options for the future are in significant conflict with the traditions of the past. This situation provides opportunities and challenges for R&D on regional resource use planning.

1.3 Regions As a Basis for Resource Use Planning

A number of different ad hoc regionalisations are used in Australia for regional planning (eg. see Woodhill and Dore (1997) and Lambert et al. (1996)). Commonwealth departments, State government agencies, industry and community-based bodies all define the concept of 'region' in ways that suit their management or administrative objectives (Ohlin et al. 1996). As a result, across Australia, decisions are often made based on conflicting assumptions about boundaries. With different groups defining 'what's in' and 'what's out' in different ways, the notion of coordination at the regional level can be sorely tested.

Regions, for example, are variously delineated in Australia by physical, biogeographic, economic, social or administrative attributes, depending on the planning, administrative and research agenda of the agencies or stakeholders concerned. Examples of current approaches to regionalisation in Australia and the purposes for which they are used are outlined in Table 2. Table 2 illustrates that a 'region' may have various definitions. Boundaries for these regionalisations may be coincident, but usually they are not.

Different stakeholders, in ways that suit their purposes, will always define regions differently. Regional approaches to planning therefore should not seek to impose new and specific regional definitions upon participating stakeholders. As a basis for regional planning, however, there is a need to negotiate a broad agreement about what constitutes a common region of interest for planning.

Table 1. Key rangeland issues relevant to the regional context

Issue	Some possible causes	Some potential impacts	Sources
Declining economic viability of pastoralism	<p>Declining terms of trade Weak commodity prices Unviable property size Slow rate of structural adjustment Limits to operation diversification Interest rates Inappropriate government policy Declining productivity of resource base Exclusion of drought probabilities from farm planning</p>	<p>Increasing farm debt Need for enterprise structural readjustments in some areas Social pathologies Exacerbated resource degradation Increasing reliance on the public sector Greater reliance on off-farm income</p>	<p>Robertson (1994) Beare et al. 1995 Vanclay and Lawrence (1995) Wilcox and Cunningham (1994) Hoey (1996) NRMWG (1996)</p>
Risk to the sustainability of the resource base	<p>Past and current over-grazing by the combined impact of domestic stock, feral animals, and native herbivores Exclusion of drought probabilities from farm planning Production systems which are inappropriate for the resource base Land clearance on inappropriate soil and bio-types Inappropriate changes in fire pattern</p>	<p>Decline in proportion of desirable perennial pasture species Increase in native or introduced woody species Soil structural decline Increased soil erosion and run-off Loss of biodiversity Loss, fragmentation and degradation of habitat Decline in livestock production Increase in greenhouse gas emissions</p>	<p>Wilcox and Cunningham (1994) Tothill and Gillies (1992) Robertson (1994) DEST (1995a) Queensland Government (1995a) NRMWG (1994; 1996) Hoey (1996)</p>
Inequitable service delivery to rangeland communities	<p>Geographical isolation Lack of employment opportunities Declining political power of rural communities Declining profitability of commercial services</p>	<p>Declining rural population and economy Declining standards of service Threat to regional social sustainability Reduced production services at times of production stress</p>	<p>Hoey (1996) Vanclay and Lawrence (1995) NRMWG (1996)</p>

Table 1. (cont'd) Key rangeland issues relevant to the regional context

Issue	Some possible causes	Some potential impacts	Sources
<p>Poor integration and coordination of policy and planning</p>	<p>Multitude of and often conflicting legislation and policy initiatives Fragmentation of responsibilities across and within three levels of government Inequitable taxation measures for low income earners and producers Lack of opportunities for community input into decision-making</p>	<p>Gap between policy intent and outcomes Mixed signals to rangeland managers Non-compliance to lease conditions Duplication/inefficiency in service delivery</p>	<p>Hoey (1996) NRMWG (1994; 1996)</p>
<p>Social problems in rural communities</p>	<p>Economic decline of family business enterprises Isolation and lack of communication Declining terms of trade Declining employment opportunities Downsizing of social infrastructure</p>	<p>Declining productivity Threat to viability of social structures Worsening indicators of social dysfunction</p>	<p>Robertson (1994) Hoey (1996)</p>
<p>Conflict over alternative land uses</p>	<p>Competition between land uses</p>	<p>Social tensions between community interests Uncertainty for all stakeholder interests</p>	<p>NRMWG (1994) Robertson (1994) Morton and Price (1994)</p>

Table 2. Examples of current approaches to regionalisation in Australia

Regional classification	Definition	Purpose/uses	Agency responsible	Source
Bio-physical approaches				
Biogeographic regions	Areas that have relatively similar patterns of geology, landform, climate and vegetation	Used as a basis for nature conservation planning in Queensland	Queensland Department of Environment	GDEH (1995)
Interim Biogeographic Regionalisation of Australia (IBRA)	A complex land area composed of a cluster of interacting ecosystems that are repeated in similar form throughout.	A framework for establishing priorities for delivering the National Reserves System Cooperative Program	Environment Australia (EA)	Thackway and Cresswell (1995)
Agro-ecological regions	Essentially, but not exclusively, based on aggregations of local government areas (LGAs) using a number of environmental components including climate, landform, lithology, natural vegetation, soils, land cover, river basins. In addition, dominant agricultural land-use and management practices and systems as well as urban and rural LGAs were taken into consideration.	An aggregation of 46 regions was used by the Standing Committee on Agriculture Working Group as a practical framework for the identification of key resource management issues relating to agricultural practices and production systems. A further aggregation to 11 regions was used by the Working Group on Ecological Sustainable Development – Agriculture sector to describe Australian natural resources and associated farming systems.	Commonwealth Department of Primary Industries and Energy (DPIE)	McNee and Hook (1992)
Tree Clearing Zones	Based on groups of native pasture communities which have similar histories of clearing and similar suitability for clearing.	The basic framework for consideration of local guidelines relating to tree clearing by community groups across Queensland.	Queensland Department of Natural Resources	Queensland Government (1995a)

Table 2. (cont'd) Examples of current approaches to regionalisation in Australia

Regional classification	Definition	Purpose/uses	Agency responsible	Source
Catchment regions	Areas consisting of either the total catchment of a single river, or a group of similar adjacent river catchments.	Areas used as the basis for the planning, development and implementation of the Integrated Catchment Management programs and policies. Areas used as the basis of an assessment of the physical and ecological condition of catchments. Areas of consideration for the planning, development and management of the water resources.	Departments with responsibility for natural resource management	Queensland Government (1991) Queensland Government, Department of Primary Industries (1993a; 1993b; 1993c)
Economic and social approaches				
Regional Councils for Social Development	Variable, but included: metropolitan regions with a population of up to 300,000; regions with a large provincial town as a focal point and smaller dispersed populations in the hinterland; or rural regions with a even distribution of relatively large population centres.	Basis for allocation of Federal social welfare initiatives under the Whitlam Labor government's Area Assistance Plan (AAP). Continue to exist in some regions where local government and community support for regional social planning remains.	Ex-Commonwealth government social welfare agencies	Jones and Thornthwaite (1994)
Aboriginal and Torres Strait Islander Commission regions	35 regions across Australia based on Aboriginal cultural considerations and statistical location of Aboriginal and Torres Strait Islander populations	Basis of allocation of funds for Regional Councils established under the Aboriginal and Torres Strait Islander Commission Act.	Aboriginal and Torres Strait Islander Commission (ATSIC)	ATSIC (1994b)

Table 2. (cont'd) Examples of current approaches to regionalisation in Australia

Regional classification	Definition	Purpose/uses	Agency responsible	Source
Regional economic Development Organisations (REDOs)	Areas, determined by key players in a region, that identify the economic linkages and community of interest that will be fundamental to the region's economic development future. Regions are large and their geographic coverage appropriate for facilitating export-oriented, internationally competitive economic development.	Basis for the delivery of the previous Federal Labor government's Regional Development Program. Basic regional framework used by the previous Commonwealth government's Taskforce on Regional Development.	Ex-Commonwealth Department of Transport and Regional Development	Department of Housing and Regional Development (1994) Kelly (1993)
Administrative approaches				
Statistical Local Areas (SLAs)	Administrative boundaries described by the Australian Standard Geographic Classification (ASGC). Usually approximates to a shire or municipality.	Statistical framework underpinning most of the Australian Bureau of Statistics (ABS) socio-economic data series.	Australian Bureau of Statistics (ABS)	Castles (1992)
Regional Assessment Panels	Panels involving State agency and community sector representatives in 68 defined administrative boundaries.	Established by the States to prioritise resources provided under the Commonwealth's National Heritage Trust (NHT)	State Natural Resource Management Agencies	Woodhill and Dore (1997)

Table 2. (cont'd) Examples of current approaches to regionalisation in Australia

Regional classification	Definition	Purpose/uses	Agency responsible	Source
Voluntary Regional Organisations of Councils (VROCs)	Voluntary groupings of local councils to address issues of common concern (approx. 50 in Australia)	Provide coordination or channels for increased information flow and awareness building on a regional basis. Predominantly used for 'networking' and 'representational' activities rather than service provision. For example: information sharing/maintaining databases; joint research and planning projects; preparation of submissions and lobbying other spheres of government; regional promotion; facilitating resource sharing; training; on-going regional planning in co-operation with State and Commonwealth agencies (eg. Regional Environmental Strategies).	National Committee on Regional Co-operation (NCRCC) promotes VROCs and provided a channel for funding support through the ex-Commonwealth Office of Local Government.	ACF (1995) Thorman (1995)

A discussion paper prepared for the Australian Conservation Foundation on the role of local government in resource and environmental planning and management advocates (ACF 1995:41) that effective regional planning needs to be based on flexible geographical units which:

- are appropriate to the key issues to be addressed (with emphasis on implementation of strategies);
- are workable in terms of relationships among the players involved;
- are compatible with administrative units used for related purposes (eg. local government areas);
- are intelligible to communities involved.

For the purposes of this review, we take the view that definition of a region as a basis for planning needs to focus less on delineating absolute boundaries, and more on finding a negotiated view which can accommodate the divergent notions of 'region' held by different stakeholders. Factors underpinning such negotiations might include: significant ecological, economic, cultural and social issues; the nature and scope of existing and potential land use conflicts; priority areas for State and Commonwealth agencies; a range of institutional structures to support regional planning; the presence of community and industry support and structures; and opportunities for research collaboration.

2. Political Calls for Regional Approaches to Resource Use Planning

Is there widespread support for the concept of integrated regional resource use planning among those major stakeholders with an interest in rangeland management? It is important to demonstrate (at least in a qualitative sense) the degree of support for it among key stakeholders. In this chapter, we determine whether there is a strong political basis for, and hence demand for, regional approaches to resource use planning in Australia. We outline the historical development of critical political statements calling for such approaches, particularly in rangeland environments. We systematically explore these calls across different stakeholder groups. We also draw a number of parallels to the social, economic and environmental stresses facing Australia's rangelands by examining debates about regional resource use planning in other contexts. Most of Australia's major bioclimatic zones (eg. the coastal zone) and resource sectors (eg. the forests) face common stresses, including the variety of competing uses and past and present unsustainable management practices.

The information we present here demonstrates that, during the last decade, statements supporting regional approaches to resource planning have emerged from across the range of stakeholders with an interest in natural resource use. Many have focused on rangeland issues. The breadth and strength of these policy positions suggests that there is broad cross-sectoral support for regional planning throughout Australia's diverse biogeographic zones, but that much negotiation is needed to make it a reality. While there are still debates about what ecologically sustainable development (ESD) is and how it can be most effectively and equitably implemented, there is little doubt that general support for the concept has resulted in direct pressure to view resource management issues from a regional perspective. While political support for the idea of ESD appears strong, it is often ill-defined and poorly conceptualised. Indeed, there are diverse definitions of sustainability and equity (see MacIntyre and McIvor 1998), particularly at the regional level.

2.1 Support for Regional Resource Use Planning Across Stakeholder Groups

While it is often presumed that calls for regional approaches to resource use planning derive from national government policy and international convention, they have come from many more sectors, including State and local government, industry and community sector stakeholder groups, and academic and research institutions.

2.1.1 International calls for a shift towards regional resource use planning

Much of the shift towards support for regional resource use planning in Australia has followed developments and agreements at the international level. The United Nations (UN) has played an important role, placing general environmental concerns on the international agenda as early as 1972 (Endre 1993:1). The UN subsequently played a central role in establishing an institutional framework for the diffusion of ESD concepts across national governments.

One of the key steps in building further support for ESD principles came from the UN appointment of the World Commission on Environment and Development, resulting in the Brundtland Report (WCED 1987). In so doing, the UN was concerned that environmental conservation was a matter that could not be effectively dealt with at national or local levels (Endre 1993:1). While the World Commission did not focus on regional planning, there is no doubt that it was instrumental in signalling a cultural shift to integrated resource management and sustainable development. The Brundtland Report (WCED 1987) states:

The integrated nature of the new challenges and issues contrasts sharply with the nature of the institutions that exist today. Those responsible for managing natural resources and protecting the environment are

institutionally separated from those responsible for managing the economy.

Following the Brundtland Report, the 1992 UN Environmental Summit in Brazil stimulated further calls for regional resource use planning in Australia. The Summit triggered many nations to respond to broader considerations in the management and monitoring of environmental quality. It supported the development of national sustainable development strategies and local action plans (i.e., local Agenda 21s; Selman 1994:461). The Australian Government has signed a number of international conventions which have established strong political and institutional bases for improved regional resource use planning (see Chapter 3).

2.1.2 Commonwealth Government

At the national level there are a number of working groups and policy processes that have called for regional approaches to resource use planning. Three main themes of debate can be identified (see also Woodhill and Dore 1997:8):

1. *Regional economic development.* This theme emerged originally from post-war reconstruction efforts under the Curtin and Chifley governments (Woodhill and Dore 1997:8). It was abandoned by the subsequent Coalition government, but re-emerged in the 1990s, largely within Brian Howe's Regional Development portfolio under the then Labor government. This theme focuses on regional economic development (via resource exploitation and infrastructure development) as a key plank of national development;
2. *Regional social development.* The second theme involves two sub-themes with social objectives. The first evolved in the early 1970s under the Whitlam administration with the establishment of an Area Assistance Program (AAP) to facilitate regional social development. This theme no longer significantly influences regional planning in Australia. The second sub-theme has evolved following the formation of the Aboriginal and Torres Strait Islander Commission (ATSIC) in 1990 and High Court's judgement in relation to native title in the *Mabo* and *Wik* judgments;
3. *Regional environmental protection/resource security.* The third theme, while recognised as far back as the 1940s (Woodhill and Dore 1997:8), evolved more recently from national developments in environmental protection, industry calls for resource security and an evolving policy framework for implementing

ESD and other international environmental commitments.

All three themes developed independently of one another, despite the interdependence of economic, social and environmental aspects of regional development. Their details follow.

The regional economic development theme in regional planning

With the election of the Labor government in 1983, a significant shift to greater Federal involvement in regional development emerged. While limited regional development functions existed within the Department of Health, Housing, Local Government and Community Services by the early 1990s, the Prime Minister's *Investing in the Nation* statement in 1993 led to the establishment of an Office of Regional Development in the new Department of Industry, Technology and Regional Development (DITRD). The office was to establish a Ministerial Council on Industry, Technology and Regional Development, build effective Commonwealth/State, private sector, trade union and local government relations on regional development, analyse the regional impacts of government policy and implement programs to enhance regional economic development. Importantly, the office was also made responsible for establishing a national Task Force for Regional Development to identify key industry and economic development issues from a regional perspective (DITRD 1993:85).

This task force was instrumental in influencing increased Federal involvement in regional development. It was led by Bill Kelty (Secretary of the Australian Council of Trade Unions) and comprised members with a range of regional development roles. The task force reported to Minister Alan Griffiths in July 1993. Its recommendations included: enhanced funding and support for regional economic development; the integration of social and economic considerations in regional resource use planning; the establishment of regional environmental jobs plans; the facilitation of regional agreements with ATSIC regional councils and the fostering and support of Regional Economic Development Organisations (REDOs) to undertake regional economic planning and development (Kelty 1993:5–13).

The task force's report influenced the government's 1994 Working *Nation* White Paper. The paper focused on economic growth and delivering employment opportunities in both urban and rural regions. It promoted business success and sustainable economic growth to generate jobs; or national

development through regional growth (Commonwealth of Australia 1994). This theme matched those of the government's national economic strategy for an export focus in industry, continuing micro-economic reform and the integration of social and environmental objectives.

One significant result of the *Working Nation* White Paper was a boost in funding and government support for regional economic development (\$150 million over four years) to be administered through the Department of Housing and Regional Development's (DHARD) Regional Development Program (see subsection 4.2.1). Minister Brian Howe evinced Commonwealth support for regional planning and development in launching the program, noting (DHARD 1994:iii):

Successful long term growth is most likely to occur where regions take responsibility for identifying their potential, assessing their strengths and developing and implementing their own strategies...Central to the program is the promotion of best practice (in regional planning and development). Regional organisations seeking assistance need to meet eligibility criteria based on the best practice in activities such as strategic planning, industrial relations and investment promotion.

With the change in Federal government in March 1996, while most funding components of the Regional Development Program were disbanded, a Ministry of Transport and Regional Development was retained to maintain a focus on regional economic development. In the first August Budget statement of Minister John Sharp (Sharp 1996:12), the new Coalition government committed itself to:

...work cooperatively with (regional leaders) to ensure that current support mechanisms for regional leadership evolve in a way that will ensure maximum support for the needs of business and regional communities...Making better use of the talent and resources available has been an objective of R(E)DOs. Even though the Government has decided not to fund new projects under the former Regional Development Program, all existing contractual commitments will be honoured, recognising the energy and commitment demonstrated by regional leaders.

Under both the Labor and Coalition governments, this general drive to enhance planning for regional economic development has not adequately integrated environmental and social considerations. At least one element of the drive, however, has sought to integrate environmental considerations more fully. Because of its dependence on the health of natural resources at the regional level, political and policy debates concerning eco-tourism development have frequently

included regional environmental issues. The ESD Working Group on Tourism, for example, recommended that regional planning should focus on integrated land use plans based on ecological systems or biophysical regions. Such regional plans, in the view of the working group, would underpin any strategic tourism plans developed by State or Territory governments in collaboration with local government and the tourism industry (Preece *et al.* 1995:45).

Further, in a report on eco-tourism to the Biodiversity Unit of the Department of Environment, Sport and Territories (DEST), Preece *et al.* (1995:72) also recommend that regional planning capabilities be developed jointly between the Federal, State and local governments to encourage and enhance the management of eco-tourism. They consider that this would require the development of information and data systems, modelling capabilities and arrangements for collaborative planning.

The social development theme

As mentioned previously, there have been two sub-themes in calls for regional approaches to planning from a social development perspective. The first of these emerged from the social welfare sector during the early to mid 1970s (see Jones and Thornwaite 1994:81), resulting in the Whitlam Labor government's Australian Assistance Plan (AAP) to facilitate regional social development (see subsection 4.2.2). With the collapse of the AAP following the fall of the Whitlam government, proponents of regional social development have not since had such a significant influence on Federal regional planning policy. Program delivery planning within Federal human services agencies (such as the former Department of Health, Housing and Community Services), has tended, nevertheless, to be strongly regionalised (Jones and Thornwaite 1994:71).

A second social development sub-theme of more relevance to regional resource use planning in rangelands has arisen through a number of legal and policy developments in matters concerning indigenous Australians. First was the establishment of 60 (now 35) Aboriginal and Torres Strait Islander Commission Regional Councils, and the election of zone representatives to the ATSIC (see Sullivan 1996). Under the *Aboriginal and Torres Strait Islander Commission Act 1989*, regional councils are required to develop regional plans for "improving the economic, social and cultural status of Aboriginal and Torres Strait Islander residents of the region" (ATSIC 1994b,c).

More recently, the findings of the High Court in relation to *Mabo and others. vs. The Queensland government* and the Wik case have placed native title issues firmly on the resource use planning agenda. In response to the original High Court decision, the Federal government passed the *Native Title Act 1993*. In negotiations leading to the Act, land councils across northern Australia played a critical role in ensuring that it provided opportunities to negotiate regional agreements. Regional agreements seek to reconcile resource use and development in Aboriginal domains with the native title and social justice aspirations of Aboriginal traditional owners. The concept has been strongly influenced by the Nananvuut regional settlements in north-western Canada (see Richardson *et al.* 1994). Indeed, Craig (1996) outlines the requirements and opportunities for the involvement of indigenous people in regional planning under international and national law and policy.

The environmental protection/resource security theme

While Commonwealth concern for regional planning until the 1990s focused on economic growth and micro-economic reform, the Government had simultaneously been promoting separate notions of regional resource use planning in the context of the environment. Initial pressures to do this arose through the listing of key areas of conservation significance under the *World Heritage Properties Conservation Act 1983*. In Queensland, for example (see subsection 4.2.1), this has resulted in the development of statutory forms of regional planning by both the Great Barrier Reef Marine Park Authority (GBRMPA) and the Wet Tropics Management Authority (WTMA).

The previously limited role of the Commonwealth in regional approaches to resource management began to increase as international pressure for a shift towards ESD principles became a greater influence on Commonwealth policy. Thus, in recent years, there has been a marked increase in Federal support for more integrated regional approaches to resource management. A substantive step was, for example, when in the 1991 Budget, the Commonwealth foreshadowed the preparation of a National Land Use Policy (McDonald 1992:249). This was an important milestone, considering the strongly held principle of the State's retaining primary responsibility for matters of land management.

Though it was created in 1989 as the result of project level conflict, the Resource Assessment Commission (RAC) was one of the first national institutions to play a leading role in assessing resource use options at the

regional level. Apart from its role in the Coronation Hill dispute, its primary focus was in relation to its Forest and Coastal Zone inquiries (see RAC 1992a:8). In particular, the Forest Inquiry underpinned the Commonwealth's eventual adoption of the concept of Regional Forest Agreements (RFAs), currently being established through Comprehensive Regional Assessment (CRA) processes. RFAs establish the framework for negotiating resource use change within regional forest industries (see subsection 5.3.2). It is important to note that under the *Resource Assessment Commission Act 1989*, the RAC was required to report to the Prime Minister on the environmental, cultural, social, industry, economic and other implications of major resource use proposals. In the view of Justice Stewart, the head of the RAC, this ensured an "integrated approach to decision making" on resource management issues (Stewart 1990:102).

Some years after the formation of the RAC, intergovernmental activity began to focus on establishing greater agreement and coordination on environmental planning and management carried out by different levels of government. In 1992, the Commonwealth, States, Territories and the Australian Local Government Association (ALGA) concluded the Intergovernmental Agreement on the Environment (see subsection 4.2.3). While this agreement does not specifically call for regional resource use planning, it again recommends intergovernmental support for integrated resource management. In the agreement, all parties concur on the need for: (Department of Prime Minister and Cabinet 1992:13)

...effective integration of economic and environmental considerations in decision making processes, in order to improve community well being and to benefit future generations.

During the early 1990s, the Commonwealth also played a more direct role in facilitating nationally significant regional resource use planning processes, by negotiating joint agreements with key States. Resulting joint initiative projects include the Cape York Peninsula Land Use Strategy (see subsection 5.3.1) and the Murray–Darling Basin Commission (see subsection 5.3.3), and a multiple Use Strategic Plan in the Southern Gulf of Carpentaria. Pressure to make a direct commitment to these regional approaches arose from development pressures and land speculation on the Peninsula the national economic significance of land degradation in the Murray–Darling, and conflict over the Century Mine in north-west Queensland.

Finally, in more recent years, various Commonwealth policy and program development processes, which have in part emerged in response to the international ESD agenda, have more specifically called for integrated regional approaches to resource management. These include the National Strategy for ESD, the National Strategy for the Conservation of Australia's Biodiversity, the National Forest Policy Statement and the Draft National Rangelands Strategy. Federal institutional arrangements supporting regional resource use planning which have emerged under these arrangements are detailed in subsection 4.2.3. In particular, these strategies have also underpinned the current focus on regional approaches to resource management being promoted through the implementation arrangements for the government's National Heritage Trust (NHT) funding (see Environment Australia 1997:1).

2.1.3 State and Territory governments

While there has been little consistency in the ways that different States and Territories have dealt with regional planning issues, the background to political calls for regional approaches to planning has paralleled the Commonwealth situation. State and Territory-level calls have often echoed the three themes of regional economic development; regional social development; and environmental protection/resource security. The strength of these calls has waxed and waned depending on the political position held by the different governing parties over recent years. The current institutional arrangements that are the result of these calls are outlined in section 4.3.

Regional economic development has been the strongest element of regional policy in most State and Territory governments for some time. State support for regional resource use planning has been channelled through program and infrastructure funding. Again, State strategies for eco-tourism development have tended to be the only regional development strategies that have strongly supported integrated resource use planning at the regional level (eg. see Queensland Ecotourism Tourism Strategy; Queensland Department of Tourism, Sport and Racing 1995). Calls for regional social development have been limited (see Jones and Thornthwaite 1994).

With the exception of Victoria's Land and Conservation Council, only in recent years have a number of States supported regional resource use planning policies from an environmental or resource security perspective. These calls have often arisen because of seemingly intractable resource use conflict in regions of high environmental value. In many instances, the adoption of policies and institutional

arrangements supporting regional resource use planning has arisen from the findings of State-based judicial inquiries into such conflicts and resource degradation crises. One example was the Queensland Commission of Inquiry into the Conservation, Management and Use of Fraser Island and the Great Sandy Region, established to resolve a number of conservation, mining, tourism, recreation and forestry linked conflicts (CICMUIFGRS 1991). Apart from recommending the establishment of an integrated regional plan, at a more general level within the State, the Inquiry recommended (CICMUIFGRS 1991:12):

The Department of Housing and Local Government coordinate and supervise the preparation and implementation of regional plans which conform with the State strategic plan (based on integrated environmental, social and economic considerations) and the preparation and implementation of local authority plans in accordance with the State and regional plans.

2.1.4 Local government

As with the State governments, a predominant theme in support of regional planning in local government circles has been a drive for regional cooperation among adjacent local governments to support economic development. This has been facilitated largely by program-based support for regional economic development at both State and Commonwealth levels. The need for effective regional organisations to administer such programs and the collective bargaining power that can be gained through regional association, has resulted in the formation of numerous Voluntary Regional Organisations of Councils (VROCs) in many parts of Australia. VROCs have often evolved to provide an informal institutional basis for regional planning (particularly economic) activities.

Local government support for integrated planning generally has been focused more at the local level. In 1992, with strong support from the Commonwealth government, the Australian Local Government Association (ALGA) released a discussion paper which set out an approach to Integrated Local Area Planning (ILAP). The intention was that ILAP would engender a stronger integrated planning ethic within local councils by creating effective linkages between planning and service delivery, sensitise planning processes to local circumstances and provide a basis for improvements in programs and regulations to enhance the quality and effectiveness of service delivery. A final ILAP guide was published in 1994 (ALGA 1994) and significant Commonwealth funding for ILAP projects in subsequent years helped

to embed the concept in local government thinking across Australia.

While ILAP has had a local focus, it has helped to engender support for integrated planning at the regional level, even though local government has traditionally been suspicious of regionalist agendas within Commonwealth and State governments. In particular, there has been increasing support for regional planning on environmental grounds within local government. As a signatory to the IGAE, the ALGA has made a clear political statement of its support for the concept of integrated resource planning and management. Thorman (1995a) notes that local government has an increasing awareness of the need for regional approaches to environmental planning and sustainable economic development. He considers that, apart from requiring the full involvement of local government, this would involve cooperative effort among State and Commonwealth agencies. Detailed guidelines for the development of Regional Environmental Strategies have now been developed by ALGA (Thorman and Heath 1997).

2.1.5 Industry support

Many industry groups have also recognised the need to move towards sustainable resource use, partly because it may be critical to their long-term economic future and partly through an increasing awareness of the impacts of unsustainable development on other community interests. Consequently, policy statements from industry groups around Australia supporting moves towards sustainable development practices have become more frequent. The objectives outlined in the North Australia Beef Research Council's strategic plan provide one example relevant to Australian rangelands (NABRC 1994:12).

Currently, because sustainable development is an evolving concept in industry circles, more specific policy statements in support of regional resource planning have generally not been routinely adopted, though there are some notable and influential exceptions. One such arose from a joint proposal to the Commonwealth government in 1989 from the National Farmers' Federation (NFF) and the Australian Conservation Foundation (ACF). In the light of obvious signs of stress within Australia's rural resource base, this joint proposal (called the National Land Management Program or NLMP) resulted in specific government action (Martin and Woodhill 1995:176). This action included establishment of the National Soil Conservation Strategy and a government commitment to provide significant additional resources to the National Soil Conservation Program (NSCP). One focus of the

NLMP was support for prioritisation and planning that would integrate action across local and regional levels.

Also relevant is the degree of industry involvement in joint working groups and task forces which have recently supported moves towards regional approaches to resource use management in rangelands. The National Farmers' Federation, for example, was represented on the National Rangeland Management Working Group. This indicates higher level support for such approaches within industry groups. The draft National Rangeland Management Strategy promoted the use of an integrated bioregional framework to identify the ESD needs of different rangeland regions. One of the key recommendations in pursuit of this objective is to: (ANZECC and ARMCANZ 1996:40)

Consider the rangelands as an agreed set of bioregions becoming the focus for the application of rangelands policies and planning.

2.1.6 The community sector

As mentioned above, industry and the conservation sector have made a number of joint calls in support of regional resource use planning. These include, for example, ACF involvement in calls for the NLMP, and involvement of the Arid Lands Coalition in the National Rangelands Management Working Group. Many State-based conservation groups also have policies favouring regional approaches to resource use planning (Fairweather, pers. comm. 7/1996).

In an increasing number of situations, rural communities themselves have been calling for regional approaches to resource use planning, particularly where they are suffering economic hardship due to resource management problems (eg. Hynes et al. 1996; Ledger 1994:74). Rural community support and involvement in integrated approaches to catchment management also indicates a level of community-based support for regional planning. This is not to say that many rural communities, however, do not remain wary of the potential for increased government and other interventions that could arise from regional planning processes.

There have also been calls in support of regional social development from the community-based welfare or social services sector. The Queensland Council of Social Services, for example, commissioned a review of regional social infrastructure planning in Queensland in 1994, as an aid to establishing a clear policy position and lobby platform in relation to regional planning issues.

Recommendations adopted by the Council at the end of the review included (Jones and Thornthwaite 1994:112):

The Queensland government should develop and implement a major policy initiative relating to the planning, development and provision of regional social infrastructure across the State.

The aspirations of indigenous people to negotiate some form of self determination at the regional level are becoming a fundamental driver in regional resource use planning activities that can resolve, through negotiation, natural resource use and land use conflicts, particularly in rangelands in northern Australia. Examples include the landmark agreement between Aboriginal people, pastoralists and conservationists in relation to Cape York Peninsula (Cape York Land Council 1996) and calls for multilateral regional agreements in the Kimberley Region (Yu 1996).

2.1.7 Calls from the R&D community

The Australian Science and Technology Council has recognised (ASTECC 1996:27) that increasing regionalisation will be a force driving science and technology activities in the next 15 years. Already, there have been a number of calls from scientific and R&D organisations for regional approaches to resource use planning. As Holmes (1994:40) points out, these include ASTEC (1993:54) and the Office of the Chief Scientist (1993). The former states that one of the benefits arising from trends towards landscape management on a regional basis is that: (ASTECC 93:54).

such arrangements emphasise regional environmental characteristics, needs and responses and promote inter-governmental cooperation along with community participation.

While these important scientific agencies have supported regional planning at the general level, there are also calls within the research literature promoting regional approaches to the management of particular bio-climatic zones (see section 2.2) and as a general resource use planning principle (see section 3.2). In relation to rangelands, at a national workshop sponsored by LWRRDC in 1993, regional planning emerged as a significant R&D priority (see Morton and Price 1994:5).

2.2 Calls for Regional Approaches Across Bio-climatic Zones and Resource Sectors

Across Australia, political calls for a shift to regional approaches to resource use planning have targeted tropical rangelands, the arid zone, native forests and the coastal zone. Table 3 summarises the resource management issues that have stimulated pressures to undertake regional planning in these areas. It also lists the main publications that have called, both successfully and unsuccessfully, for regional resource use planning to address these issues in a holistic and integrated way. The following sections highlight the similarities between the issues facing different regions and sectors, suggesting too that, in developing regional planning activities in rangeland areas, experience from other bio-geographic regions and resource sectors might perhaps be drawn on.

2.2.1 Tropical savannas

More than any other biogeographic zone, Australia's tropical savannas are experiencing major economic, social and demographic changes in the ways in which land is used and valued (see Ash 1996). The multiple uses and values associated with these lands are giving rise to a number of prominent land use conflicts and related pressures. In this context, Holmes (1996c) advocates basic institutional reform. He considers that the most striking changes have been in land ownership and tenure through recognition of Aboriginal land rights, the retreat of pastoral tenures from the most marginal lands, and the search for new tenures to accommodate non-pastoral uses. He considers that State and Territory responses to these challenges have been fragmented and belated, and over-reliant on legislative solutions. In particular, he advocates reforms of property rights which accommodate private use rights to ensure compatibility with the emerging resource use opportunities.

Holmes (1996c) considers that "in keeping with an enhanced public role in resource allocation and conflict avoidance, there is a growing need for strategic regional planning, focussing mainly on marginal regions and urban development regions". He considers that such planning needs to be linked to changing land tenures and uses, and to more coordinated, informed and sensitive approaches to environmental, social and economic impact assessment. Importantly, he states that (Holmes 1996c):

Successful regional planning will only emerge following an extended learning period, given the novelty of the context, the rapidity and unpredictability of change and the mix of interests meriting a role in the planning process.

2.2.2 Arid Australia

Much of Australia's arid and semi-arid rangelands have been used for pastoral production for nearly 150 years. These lands bear a legacy of degradation and species loss as a result of past policies and land management (eg. Tothill and Gillies 1992; Morton *et al.* 1995).

In examining the future of these lands, Morton *et al.* (1995) distinguished two closely linked but potentially conflicting concepts of sustainability: (i) the concept of sustainable use, which is an *enterprise objective* relating to "the management of land in such a way so as to maintain the productivity of the area in perpetuity for that land use"; and (ii) the concept of ecological sustainable land management, which is a *regional goal* relating to "the management of a region so as to allow the maintenance of all its ecological functions and thereby ensure the persistence of its biodiversity". They suggest that the challenge of arid land management is to devise land allocation procedures that would "allow both regional conservation of biodiversity and use of land for other purposes, such as pastoralism, Aboriginal use, or tourism". Morton *et al.* (1995) propose the implementation of a process by which *all* arid land users come to act as land stewards, obtaining services from the land in an ecologically sustainable manner. Critical factors identified for the success of this process include: changes in legislative arrangements and coordination across different agencies and spheres of government; the informed involvement of current land managers; and financial assistance to enable managers of marginal lands to remain in a stewardship role to assist with the management of feral animals, weeds, fire and local reserves.

As an example of the problems faced in arid lands, the semi-arid mulga lands of Queensland face substantial resource degradation, loss of biodiversity and a declining ability to sustain pastoralism and other economic uses (Queensland Department of Lands 1993; Sattler 1986). This has led to major reconstruction of the pastoral industry in this region. Concurrent with this, there have been calls for the development of a regional conservation strategy. Sattler (1986) proposes that a regional biogeographical framework be developed for the region as a basis for strategic planning. He sees that this framework would "provide the focus needed to

develop a representative National Park system and to develop action plans for major regional conservation issues".

In response to the situation in the mulga lands, the Queensland Government issued a position paper in 1992. The paper noted the interdependence of environmental conditions, pastoral productivity, economic viability and social stability in the region, and therefore the necessity for an integrated approach to land use planning and land management to successfully address regional land use problems. These problems related to land degradation, water management, small uneconomic property size, loss of biodiversity and the impacts of kangaroos and feral animals. Currently, a major restructuring strategy is being implemented for the pastoral industry in this region.

2.2.3 The native forest sector

Over the past two decades, the use and management of the native forest estate has been the subject of one of Australia's most divisive political debates. Initial government responses often resulted in the gazettal of national parks and world heritage listings, often with pronounced social and economic impacts on local communities and creating hot spots within the broader political debate. In addition, disputes over forest preservation have led to whole communities reacting to what they perceive as "outsiders" interfering in both their local economy and their way of life (SRCU 1993:1).

Continuing dispute over the sustainable use of native forest resources in the early 1990s resulted in a range of high level processes which influenced the development of a joint Commonwealth, State and Territory position in relation to forest management. These processes included the ESD Working Group on Forest Use, the National Plantations Advisory Committee and the RAC's Forest and Timber Inquiry. The impetus for discussions was also stimulated by the National Conservation Strategy for Australia and the 1986 National Forest Policy developed by the Australian Forestry Council.

The outcome was the National Forest Policy Statement, which was adopted by all States and Territories (except Tasmania) in 1992. The statement outlined agreed objectives and policies for the future of Australia's public and private forests, and presented a vision for the sustainable use and management of Australia's forest resources (Commonwealth of Australia 1992b).

Table 3. Resource use issues in Australia's key geographic zones and calls for regional approaches to planning and management

Zone/sector	Resource base	Characteristic resource management issues	Documented calls for regional approaches
Arid zone	<p>Often termed arid and semi arid rangelands. Used for pastoralism for up to 150 years. 66% of the zone supports pastoralism. 22% and 14% of meat and wool production respectively. 2 in area. 5.5 million km² in area. Population less than 300,000. Environmental constraints include infertile, acidic and erosion-prone soils and low annual rainfall. Predominantly leasehold tenures. Declining water quality</p>	<p>Serious declines in native species. Desertification and soil erosion. Significant weed and feral animal problems. Fire management and woody regrowth. Increasing Aboriginal ownership of country. Declining pastoral productivity. Increased mining and tourism development. Very few opportunities for diversification or improved practices Significant land degradation due to oversupply of water through bore drains, overgrazing by domestic and feral animals, build up in kangaroo numbers, inappropriate management practices, closer settlement policies, and fire exclusion. Inappropriate property size and need for structural adjustment. Land market prices have not reflected actual land condition High unemployment and lack of training causing social problems and welfare dependency. Reconstruction strategies based on regional development/ property build up often needed.</p>	<p>Foran <i>et al.</i> (1990) Sattler (1994) Morton <i>et al.</i> (1995) Queensland Department of Lands (1993) Hoey (1994)</p>
Tropical savanna zone	<p>Often termed tropical savanna rangelands. Heterogeneous landscape subject to much less modification than most other bio-climatic zones. Some 22% of pastoral lands have been transferred to other titles and non-private ownership over the last 20 years. Less than 54% of the zone remains as pastoral lease, the remainder comprising national parks and Aboriginal lands. 846,592 km in area.</p>	<p>Significant shift to private ownership of pastoral leases. Significant shift to Aboriginal land ownership. Resource degradation/ productivity declines Marginal pastoral lands viewed as being more significant for conservation. Urban development pressures in some areas.</p>	<p>Sattler (1994) Holmes (1996a)</p>

Table 3. (cont'd) Resource use issues in Australia's key geographic zones and calls for regional approaches to planning and management

Zone/sector	Resource base	Characteristic resource management issues	Documented calls for regional approaches
Native forest sector	<p>Only 5% of Australia's land surface. Some 41 million hectares of native forest and 1 million hectares of plantations (90% softwood) Some 34.3 million ha of native forest capable of producing wood for commercial utilisation. Some 42% of the total area has already been disturbed by logging activities.</p>	<p>Only a fraction of the pre-European forest cover remains. Significant conflict between commercial use, conservation and cultural/social values. Sustainable use regimes are difficult to define. Threats to biodiversity from unsustainable management practices Significant communities and regions depend of the forest economy.</p>	<p>ESDFUWG (1991). RAC (1991) Commonwealth of Australia (1992b)</p>
Coastal zone	<p>Zone extends as far inland and as far seaward as is needed to achieve the objectives of management. In 1986, 26% of Australia's population (4.1 million) lived in the coastal zone. Some 67% of this figure can be found in the major urban settlements between Cairns and Adelaide. Projected 25.1% increase in population on SLAs abutting the coast between 1990 and 2005.</p>	<p>Need to promote and develop new activities without diminishing the resource base. The need for resources to cater for further population growth and urbanisation. Increasing levels of water and air pollution. Significant pressures upon wetland ecosystems. Overfishing (recreational and commercial). Threats to areas of high biodiversity, ecological and recreational significance Economic value of the coastal zone to tourism and primary production. Duplicative and ineffective regulations. Overlapping responsibilities between agencies. Pricing of resources on a user pays basis, including assignment of property rights. Lack of clear objectives and strategies for coastal zone management. Difficulties in the integration of management activities into broader frameworks.</p>	<p>HORSCERA (1991) CICMUFIGER (1991) RAC (1992d)</p>

It aimed to establish a management regime focused on ESD approaches to a range of uses and values, including tourism, recreation and the production of wood and non-wood products. The statement promotes the need for integrated and coordinated decision-making and improved interaction among forest management agencies, resulting in agreed, durable and regionally-based land use decisions.

Apart from reaffirming Commonwealth, State, Territory and local government commitments to the fundamentals of the IGAE, the Commonwealth Government agreed on the need for a single comprehensive regional assessment (CRA) process whereby the States can invite the Commonwealth to participate in the undertaking of all assessments needed to meet Commonwealth and State obligations for the forested areas of a region (see subsection 5.5.2). CRAs were intended to involve the collection and evaluation of information on environmental and heritage aspects of forests and provide a basis for both parties to reach an agreement on management of forests in the region, including national estate, world heritage, and Aboriginal heritage values, environmental impacts and obligations relating to international conventions (Commonwealth of Australia 1992b:24).

2.2.4 The coastal zone

Since the 1970s, natural resources in the coastal zone have been affected by rapid population growth, increased recreational and tourist visitation and substantial building and other development. These direct pressures have been bolstered by indirect impacts arising from water pollution, erosion, sedimentation and the overuse of fisheries resources. Conflicts have arisen among conservationists, recreational users, tourists, developers and indigenous users of coastal resources (RAC 1992d:9). As localised development impacts were blending into regional level resource use changes (eg. rapid urban growth around metropolitan regions), rising political pressure from the environmental movement resulted in the RAC being provided the terms of reference for its third inquiry. The Coastal Zone Inquiry began in February 1992. It progressed through a number of formal stages, including public participation, inquiries and the direct involvement of stakeholders

throughout. Following the release of a draft discussion paper presenting the preliminary conclusions and recommendations, a final report was completed in November 1993. This report advocated integrated environmental management of the coastal zone (RAC 1993b). Underpinning this, and one of the RAC's core recommendations, was the establishment of a National Coastal Action Program to improve management of Australia's coastal resources. The intention was that the program be adopted by the Council of Australian Governments and implemented by all three spheres of government in consultation with the community and industry. In direct support of regional resource use planning, the Commission recommended (RAC 1993b:363) that:

...all governments with coastal zone responsibilities develop local and regional coastal zone management objectives that are consistent with agreed national objectives and that provide firm guidelines for integrated management of resources within each government's jurisdiction.

In particular, the Commission recognised that many coastal zone management issues extend beyond the boundaries of individual local authorities, and to other land based and marine resources. As a consequence, it saw as essential a regional approach to coastal zone management, fully supported by local, State and Commonwealth governments., and It considered that the 'tyranny of small decisions' must be overcome by integrated regional planning, specifically recommending (RAC 1993b:379) that:

...regional coastal zone strategies be developed, principal responsibility for their promotion and implementation resting with the State governments; and that the regional strategies be developed by groups comprising representatives of regional communities and industries, local authorities, and relevant State and Commonwealth government agencies.

In doing this, the RAC considered that regional boundaries needed to be reviewed and redefined by the States, as far as practicable, on biophysical, social and administrative bases. It also recommended that marine areas be included within these boundaries to ensure that land based activities that affect marine resource use are taken into account (RAC 1993b:379).

3. History, Elements and Principles of Regional Resource Use Planning

This chapter reviews the historical development of regional planning theory and practice and outlines its key elements. The review illustrates the failure of the old 'technical' or 'rational' schools of planning thought to come to terms with the technical complexity of regional ecosystems and to deal with the conflicting agenda of stakeholders in a pluralistic society. Given the differences between producer, conservation, mining, Aboriginal and other perspectives in rangelands, it is essential that regional planning address both complexity *and* conflict. Thus, planning theory is increasingly being called upon to support improved processes of negotiation among stakeholders, while continuing to enhance its technical and administrative basis. Consequently, developments in planning theory are now drawing upon parallel developments in social, environmental and economic theory. Because these components of regional environments are interconnected, aspects of systems theory in all of these fields are increasingly being applied, leading also to an increase in proposals for more communicative and adaptive approaches to regional planning.

Following discussion of theory, this chapter develops a number of key principles within which we consider that regional resource use planning best operates. These principles are then used to underpin our assessment of contemporary Australian regional resource use planning in chapter 5.

3.1 A General History of Regional Planning Theory and Practice

3.1.1 Historical developments in planning theory: rationalists vs. the pluralists

Contemporary planning theory has evolved from the centralised and rational models of planning that surfaced after World War II; a time when there was a strong call for large scale intervention in public affairs. Support for "synoptic rationalism" (see Simon

1947) was further developed by March and Simon (1958) in an attempt to link technological innovation with planning. Rational approaches to planning relied on the assumption that centralised planning agencies held the power to develop and implement 'unit' plans for the good of society as a whole. Consequently, they relied on the application of traditional technical and scientific methods to achieve objectives primarily focused on economic and infrastructure development.

Realising that "rational comprehensive" planning was often preached but, because of human and resource limitations rarely practised, Lindbolm (1959) characterised the more commonly used practices as "successive limited comparison" techniques in the 1950s. Concluding that policy decisions were better arrived at by interactions among established institutions (often public or significant corporate institutions) operating within the centralised bargaining processes of a democratic, free market economy, he later proposed "incremental decision making" (Lindbolm 1965).

Later, Etzioni (1967) proposed that "incrementalism" would lead to an uneven power distribution among groups in society, resulting in under-representation of the politically marginalised. Taking account of the limits of the rational and incremental approaches, he proposed "mixed scanning"; a synthesis of both previous models. This model provided a realistic overview of planning strategies in a variety of policy fields and allowed the planner to focus on specific issues when necessary and as resources allowed. At the same time, it maintained an overview of the entire planning community. Nevertheless, the intention remained for the model to be operated by strongly centralised planning agencies.

Planners and centralised agencies began to lose control of the planning agenda as advocacy planning evolved during the 1960s; a result of the adversarial procedures used in the legal protection of minority groups over planning-related issues (see Hudson

1979:389). Advocacy planning proved successful in blocking insensitive centralised plans and it challenged the traditional view of the unitary public interest (see Alinsky 1972; Heskin 1977). From this emerged an understanding of the need for public participation and negotiation during planning.

Amidst further criticism of rational comprehensive planning approaches, Friedmann (1973) proposed “transactive planning”. Transactive planning was carried out in face-to-face contact with people affected by decisions, and interpersonal dialogue was intended to underpin a process of mutual learning (Hudson 1979:389). It also encouraged the evolution of decentralised planning institutions that helped people to take increasing control over governance issues.

The early to mid seventies saw the emergence of two forms of planning based on comprehensive, grass-roots approaches. One form of ‘radical planning’ stressed personal growth and cooperative spirit (like transactive planning). The other took a more critical and holistic look at large-scale social processes such as the class structure, economic relationships, the historical dynamics of social movements, control by culture and media, confrontations and alliances (see Hudson 1979:390).

While these developments in the theory sought to address the problems arising from synoptic planning approaches, their primary aim was still to provide planning solutions for centralised planning agencies. The need remained for models that could successfully balance the use of technical or scientific planning procedure with an equitable trade-off between pluralistic social goals. Fortunately, a stronger link between public policy studies and technical procedural planning began to emerge in the 1970s and 1980s, with new planning approaches that were related to trends in conflict resolution (McDonald 1989). Many early developments, however, focused on the creation of information technologies, particularly models seeking to analyse interconnected decision areas and multi-objective planning problems (see Friend and Hickling 1987). This work was useful in coming to terms with complex planning decisions, but tended to retard the development of procedures which shifted control of decision-making away from centralised planning agencies.

To emphasise the need to break away from centralised planning control, and based on the growing bargaining and negotiation literature, Dorsey (1986) described how planning by bargaining could balance the conflicting objectives of competing resource users. Many planners and academics now

assert that planning is actually a political process of bargaining and negotiation among competing interests within the constraints of law and government bureaucracy (eg. see McDonald 1989; Susskind 1987; Amin and Thomas 1996). Indeed, Faludi’s (1987:134) “decision centred approach” to environmental planning encourages all stakeholders to have their own ‘plan’ which provides them with an effective bargaining tool within the decision-making system.

3.1.2 Planning as a framework for negotiation

The foregoing discussion reveals a clear trend in the literature away from rationalist views of planning towards pluralist views that encourage negotiations among diverse interests in the community within the bounds of law and government bureaucracy (see McDonald 1989). Dale and Lane (1994:253), however, point out that there remains:

an ongoing theoretical and practice-orientated debate between those who view land use planning as a technical-scientific process and those who contend that it is a political process involving negotiations and trade-offs among competing actors with an interest in land use outcomes.

At a basic level, this perhaps reflects the divide between those with functionalist (ie. society sharing common goals) versus pluralist views of society

At one extreme, rationalist planners continue to see the agency-driven, goal-orientated planning that they carry out for their department or authority as having supreme legitimacy over other world views or even the goal-orientated planning processes of other agencies. It should be noted that, while the planning literature of the 1990s rarely advocates the rationalist planning agenda, ‘rational’ planning approaches are still frequently employed by agencies responsible for land use planning in Australia (see Cowell 1996; Dale 1996).

Perhaps at the other extreme, the views of the pluralists within the planning literature can be summed up in the concluding remarks of Reiner (1990:77) in a discussion about choice in the application of planning theory. He states (Reiner 1990:77) that, if contemporary governments were to return to more compassionate and redistributive commitments, then any resultant plans would:

...have communitarian emphases, and high priority would be given to social purposes and goods. It would speak to the notion of widespread empowerment, but within and not necessarily in opposition to, the state. As such, the (planning) theory would react critically to the

current vogue of privatisation and individual enterprise; it would even question the vogue of dominance of market relations in all phases of human endeavour.

Dale and Lane (1994:253) and Bryson and Delbeque (1979) contend that subscribers to either one of these two schools are not fundamentally in error. Instead, they suggest that these debates have arisen from misunderstandings about the context in which particular modes of planning should be applied. The debate perhaps also arises from the term 'planning' being poorly defined and viewed differently among various sectors and professions.

The context in which planning operates can be extremely variable and depends on the distribution of power within the planning community or arena (ie. the area, region, state or nation being planned). Table 4 outlines the models of planning best applied in these different contexts. When the planning community comprises many stakeholders, their competing objectives need to be satisfied to a reasonable degree if the planning outcomes are to be equitable. It is in this highly political context that regional planning within rangelands needs to occur, and as such, *the model adopted should balance the need for government intervention in planning and the empowerment of regional communities to negotiate effective regional strategies. This does not mean, however, that planning by negotiation should not be informed by a core of technically sound methods for issue assessment and strategy development* (eg. Bryson and Delbeque 1979).

3.1.3 Parallel themes in regional planning theory and practice

Having highlighted general trends in planning theory, it is useful to examine the evolution of regional planning theory. Regional planning theory has been bound by the same constraints as general planning theory. The debate between those who view planning from a technical perspective and those who view it as the framework for negotiating across conflicting agendas has equally been played out in the regional planning literature. Again, the debate has not generally recognised the pluralist context in which regional planning occurs. Consequently, the literature revolves around physical factors (eg. infrastructure development, environmental protection), resolving intra- and international economic inequities (eg. calls for market interventions in economically disadvantaged regions) and the application of geographic information systems (GIS) and decision-support systems by central planning agencies (eg. see MacRae and Brown 1992:213).

As a result, regional planning professionals have embraced the application of GIS, other information technologies and well developed social, economic and environmental assessment methods. The regional planning literature, however, concerns itself little with the establishment of effective frameworks for either negotiation among stakeholders at the regional level or improved methods for enhancing the participation of constituent individuals and sub-groups within stakeholder groups. An understanding of the principles behind these two areas has to be gained by reference to the literature on negotiation and community development and participation.

There is also little evidence of integration of the social, economic and natural sciences within the regional planning literature. However, for many years there have been calls from individuals outside the planning profession for regional approaches to better address social, economic, and ecological issues. These calls have usually been based on non-integrated themes of social development for disadvantaged regions (eg. Cheers 1994; Jones and Thornthwaite 1994), regional economic development to ensure equitable national development (eg. Guille 1995; Kelty 1993) and environmental planning (including the restoration or better management of rural systems or the protection of threatened regions of conservation significance) (eg. Hadley 1993:26; Alexandra 1996).

As a result of this poor integration across disciplines, Steiner (1983:306) identified a significant split between traditional planners and ecologists/ natural resource planners in the academic literature on regional planning. He considered that this divide is epitomised by the early but divergent works of John Friedmann (1973) and Ian McHarg (1969). He argued that while Friedmann considered that regional planning evolved from special theories in economics and geography, McHarg was seriously concerned that ecology was entirely absent from planning practice. These deficiencies persist in the contemporary literature.

Table 4. Appropriate approaches to regional planning in differing planning contexts.

Regional planning characteristics	Distribution of power within the planning community		
	Strongly centralised	Weakly centralised or fragmented	Dispersed
View of planning	Rational, centralised decision making	Weakly centralised decision-making encouraging stakeholder participation	Bargaining and negotiation among stakeholders within the constraints of law and government administration
Style of planning	Rational/technical	Participatory	Political/bargaining and negotiation
Role of planners	Bureaucratic/technocratic	Adviser/facilitator	Advocate of particular stakeholders or mediator between them
Role of plans	Central technical plans based on presumed societal values	Central plans balance the views of different stakeholder group	Each stakeholder group develops its own plan as a basis for bargaining and negotiation

Source: Modified from Friedmann (1973:71) and Dale and Lane (1994: 255). Note that this table characterises how planning should operate in ideal social circumstances, not how it actually operates, in existing political regimes (ie. it does not seek to legitimise the planning style of non-democratic regimes).

3.1.4 Matching regional planning to the rangelands context

Against this background of planning theory and in light of the diverse stakeholder interests in Australian rangelands, there can be little doubt that regional resource use planning in rangeland areas will occur within a political context. This means that those responsible for facilitating such planning need to craft their approach to match the political context. As a result, we would argue that regional resource planning should comprise at least three core elements:

- the effective application of technical information (in the biological, social and economic sciences) and appropriate information technologies to assist in structuring frameworks for negotiation among stakeholders and to better inform the negotiation process;
- structuring, operating, institutionalising, implementing and monitoring regional planning in a way that facilitates active negotiation among stakeholders within the planning arena;
- processes which ensure that stakeholder groups involved in the planning negotiations are able to represent their constituents through appropriate participatory methods, giving credibility to the agreements negotiated as a result of the regional planning process.

The following three subsections explore aspects of regional planning of relevance to each of these three core elements. This provides a basis for defining best practice principles for measuring the value of regional approaches to resource use planning in rangelands in section 3.5.

3.2 Technical Aspects of Regional Resource Use Planning

This element is equally important in both rational and more negotiatory forms of regional resource use planning (see Bryson and Delbeque 1979). In either case, technical competence in planning requires an understanding of the complexity of regional ecosystems and how they operate. This necessarily includes all forms of economic, social and environmental assessment, and is increasingly calling for adaptive approaches to management. Technical competence in planning also applies to the flexible use of information technologies to assist in these assessment and adaptive management processes. Information technologies can be used both to underpin rational planning and to provide the information base and structure needed to underpin negotiations over resource use. This section also deals with issues relating to the integration of technical disciplines.

3.2.1 The role of information technology in regional resource use planning

The need to systematically address complex regional problems through the analysis and synthesis of pertinent information and knowledge, and the effective communication and management of uncertainty, have been widely advocated (eg. Briassoulis 1989; Costanza *et al.* 1992; Slocombe 1993; Norton *et al.* 1996). The contributions of such approaches to regional resource use planning are to:

- identify options, explore alternatives, and choose effective, equitable and sustainable courses of action (eg. Briassoulis 1989; Fedra *et al.* 1994; Gordon 1995; Bellamy *et al.* 1996);
- develop procedures to assist negotiation relating to the allocation of environmental resources and services equitably and efficiently (eg. Briassoulis 1989; Stuth and Stafford Smith 1993); and
- improve the effectiveness and equity of individual and collective decision-making, including learning about a problem and its context, and understanding how it came about (eg. Stuth and Stafford Smith 1993; Wood and Wood-Harper 1993; Bellamy and Lowes, *in press*).

Computer-based information technologies, (IT) developed to provide support for decision-making are promoted as critical tools in making these contributions. These tools include decision support systems (DSS), expert systems, knowledge-based systems, and geographical information systems (eg. Guariso and Werthner 1989; Stuth and Lyons 1993; Goodchild *et al.* 1993). The type of IT tools required for complex decision-making contexts will depend on two major factors: (i) the characteristics of the problem; and (ii) the characteristics of the decision-making context within which solutions to the problem at hand are sought, devised and pursued.

Characteristics of regional planning problems relate, for example, to their origin, their spatial and temporal scale, the magnitude of their possible impacts, the degree of complexity and connectivity of the systems involved, and the tractability of the problems (eg. Briassoulis 1989; Dovers 1996). In contrast, the characteristics of decision-making environments relate in general to: the nature of the decisions to be made; the availability and accessibility of disciplinary and professional inputs; the traditional structures and mode of public decision making; the distribution of power and authority; the policy framework and institutional structures in support of the decision taken; and the generating forces (ie. social, economic,

political) behind decisions (eg. Briassoulis 1989; Norton *et al.* 1996; Dovers 1996).

This review identified previously that the decision-making context for regional resource use planning and management will involve a multiplicity of stakeholders with different perspectives, decision-making processes, technical expertise, and requirements for information. Moreover, the regional resource use issues will often not be clearly defined; with long time horizons and frequently characterised by vast separation of cause and effect. Consequently, there is likely to be significant uncertainty, lack of definition, and potential conflict in decision-making processes. Decision-making will be in a context of changing sociological, economic and ecological objectives, with one of the most difficult dilemmas facing decision-makers being the common incompatibility of ecological sustainability goals, social equity goals, and economic efficiency goals.

The literature indicates that IT innovations have potential application in two key areas; in support of the R&D on regional planning itself, and in support of the implementation of the planning process. Within these areas, IT applications are perceived to provide opportunities for support for a number of key roles including: the synthesis and analysis of information and knowledge relating to complex systems; providing opportunities for recognising and communicating uncertainty in decision-making processes; facilitating learning about resource use problems or planning processes and their contexts; and supporting argumentation and negotiation for conflict resolution. These issues are briefly discussed below, along with participation in, and the effectiveness of, IT development and use.

Synthesising information and knowledge

The complex and multi-disciplinary nature of the management and planning of regional resource use systems requires: (a) the representation, management and integration of diverse types and sources of information and knowledge with various degrees of accuracy and precision; and (b) the linking of this information and knowledge with analytical tools for modelling system components or parameters, or evaluating alternative management options. The integrated approach captured within advanced IT applications such as spatial DSS is particularly appropriate as a platform for meeting these requirements through support for the synthesis of information and knowledge (eg. Stuth and Stafford-Smith 1993; Loh and Rykiel 1992; Bellamy *et al.* 1996; Lowes and Bellamy 1994).

An integrated approach to the design and development of IT applications for sustainable resource use and management has a number of distinct advantages including: (i) the synthesis of the existing knowledge base relevant to decision-making processes, and its ready accessibility; (ii) the incorporation of qualitative information relating to best practices and other 'expert' knowledge; (iii) the incorporation of technical and scientific knowledge in formal models, rules and relationships; (iv) facilitating both the interpolation of data and its extrapolation from one domain or spatial context to another; (v) enabling the exploration by the user of the spatial and temporal aspects of the issue of concern and its context; and (vi) enabling the formulation and evaluation by the user of 'what-if' scenarios relating to the environmental and socio-economic trade-offs associated with alternative resource use and policy options (Bellamy *et al.* 1996).

It would seem from the literature that well designed, integrated IT systems have the potential to provide an easy-to-use interface for interrogation and communication. This interface can be accessible to a diverse group of stakeholders for use in negotiation, bargaining and other participative processes integral to effective regional resource use planning.

Recognising and managing uncertainty

An important characteristic of the decision-making environment associated with regional resource use planning is the complexity and high level of uncertainty associated with the biophysical and socio-economic components of the managed system and their linkages. The data and knowledge bases available to planners and decision-makers in regional planning processes, while potentially extensive, will be characterised not only by uncertainty, but also by incompleteness, spatial and temporal variability, and fuzziness. The propagation of uncertainties is therefore inevitable in modelling complex interactions of environmental systems as well as in integrating various models and different information technologies (eg. GIS, database management systems, knowledge-based systems). Ensuring the quality of information provided by an advanced IT application involves minimising errors not only in input data but also in the representational models used.

Because of the complexities of quantitative data and models, Moffatt (1990) suggests a greater reliance on causal mechanisms and processes than on quantitative relationships for complex environmental problems. Similarly, Grayson *et al.* (1993) argue that, under these circumstances, reliance on quantitative

estimates should be replaced by qualitative descriptions of the pattern of natural system responses, and that this information should be combined with simple reasoning to assist the decision-making process. This relatively pragmatic approach is consistent with both the availability and quality of so-called 'hard' data and the general ability to represent complex natural and human systems. Therefore, the effectiveness of modelling of these complex systems using ITs depends largely on: the quality of the causal and conceptual models used (ie. the degree of understanding of the 'real' world that they encapsulate); the quality of the input data (eg. the conceptual models used to describe the phenomena, spatial and temporal variability, and measurement techniques); and the effectiveness of the techniques used to integrate various and diverse data/information sources (Bellamy *et al.* 1995).

Three categories of uncertainty have been distinguished by Lang (1990b) with respect to integrated resource management and planning: uncertainty concerning 'the problem' and its context; uncertainty concerning what to do about it; and uncertainty concerning what 'others', in related fields of choice, may do. In many instances, problems facing decision-makers may be sufficiently advanced or developed to be irreversible, at least in an economic or social sense. Under these circumstances, Funtowicz and Ravetz (1990) suggest that the practical considerations become restricted to those of coping, presumably within the constraint of vastly changed and inferior environmental conditions. Alternatively, where a resource quality issue is not definitely known or recognised to be irreversible, it may still be considered to be too complex to resolve in a sufficiently short period of time (Funtowicz and Ravetz 1990). The resource use and management planning imperative is that decisions with profound consequences be taken with a degree of urgency, albeit in conditions of uncertainty and sometimes indeterminacy (Funtowicz and Ravetz 1990; Dovers 1996). This compounds the complexity inherent in regional resource use and management issues.

Uncertainty, whatever its origin, needs to be managed and communicated so that it becomes a recognised input to decision-making (Funtowicz and Ravetz 1990; Costanza *et al.* 1992). Advanced IT applications such as knowledge-based systems, used in conjunction with tools such as GIS, can provide a means of explicitly representing these attributes, in order to provide a range of users with high quality information. There would seem to be considerable scope for IT applications to assist decision-makers by removing some of the underlying sources of

uncertainty, and facilitating bargaining and negotiation processes amongst the multiple stakeholders of regional resource use planning processes.

Facilitating learning processes

Decision-making processes in resource use management and planning have been perceived as being focused on a bounded set of possibilities for finding the optimum solution. In this context, advanced IT applications have generally been task-orientated with a focus on tactical decision-making. DSSs, for example, are often perceived to provide decision-makers with a problem-solving environment within which they can explore, structure and resolve complex problems by using existing knowledge (Guariso and Werthner 1989; Densham 1991). Until recently, their primary role was seen to be improving decision-making and providing users with the means to formulate, assess and compare alternative outcomes more objectively and comprehensively (Stuth and Stafford Smith 1993). However, increasingly the most important part of the problem-solving process lies in considering how the notion of 'problem' can be conceptualised from the outset (Wood and Wood-Harper 1993). An emerging role for decision-support technology therefore is not in supporting tactical decision-making, but in providing a flexible environment in which learning can occur about the decision situation or context, and the processes by which the problem has come into existence (Angehrn and Jelassi 1994; Wood and Wood-Harper 1993; Bellamy and Lowes 1995).

Conceptually this applies to individual as well as organisational learning. To be effective, Wood and Wood-Harper (1993) find that such technology would need to incorporate a number of features: a focus on the formulation of the 'problem' rather than merely providing an objective description of it; a capability to allow the decision-maker/user to explore the problem context in terms of constraints, likely impact, leverage, etc.; providing for 'conversations about possibilities' through the analysis of past actions, and speculation about potential future actions; and finally, it would need to be evolutionary and emergent in nature.

Learning processes have been described as "a constant flux between finding out what is happening in our world, making sense of it, and taking action" (MacAdam 1995). In a collaborative learning situation, the differing perspective each participant brings to bear creates a richer knowledge base from which to draw new insights, and shared ownership of the outcomes. MacAdam (1995) sees monitoring and

evaluation as integral aspects of this process of learning. Learning becomes an iterative process in response to inevitably changing circumstances which can never be adequately anticipated in complex contexts. Monitoring and evaluation therefore become the means by which stakeholders can engage in dialogue about their claims, concerns and issues. They are also the means of integrating the particular perspectives and specialised efforts of different stakeholders and of building ownership of the whole (MacAdam 1995).

These concepts are particularly relevant to IT development processes. If the various stakeholders in the IT innovation have a say through monitoring and evaluation during system development, the resultant system will have facilitated ongoing and collaborative learning. Jiggins (1995) proposes that, if action is required on a societal scale and in a limited time frame, the way to achieve a significant voluntary behavioural change is to involve the people affected in assessing the situation and developing and reviewing the options. The learning aspects of DSS use and development may have a key role in assisting decision-makers and planners to adapt to changing economic, social and political environments, to develop new skills, and to acquire expertise in those domains (Climaco *et al.* 1995; Bellamy and Lowes 1995). Three types of learning may be fostered: by analogy, involving transforming knowledge in one context to perform a similar task or action in another context; from examples, in incremental concept and/or knowledge-acquisition process; and from observations arising from passive observation through to active experimentation (Climaco *et al.* 1995).

Advanced IT applications can also be used as a mediator and translator between so-called experts and decision-makers, and between science and policy (Fedra *et al.* 1993). In this sense, Fedra *et al.* (1993) proposes that IT applications may provide not only direct and interactive access to a large volume of information and a mechanism for analysis but also, and more importantly, a vehicle for communication, learning and experimentation. In this role, IT applications could provide a mechanism for facilitating negotiation processes for resolving or ameliorating resource use conflicts.

Supporting argumentation and negotiation processes

There are many stakeholders in regional resource use planning. They have multiple and conflicting objectives. A number of regional planning projects have identified a key role for IT tools to help

mediation and negotiation (Gordon 1995; Cannell *et al.* 1996), and to develop methods to represent argumentation (Bench Capon *et al.* 1991). For example, knowledge-based systems may be used to represent the different views, value sets and arguments of stakeholders as a means of identifying conflicts. IT applications can allow stakeholders to develop arguments, to evaluate the arguments of other stakeholders, and to facilitate negotiation through the improved understanding of the values and goals of other stakeholders. This can be applied to facilitate conflict resolution in regional planning. In addition, logic representations of policy rules and legislation may be used to facilitate the assessment of conflicts and the analysis of implications and inconsistencies.

Participation in IT systems development processes

A broad range of R&D studies and disciplinary perspectives has emphasised the importance of stakeholder participation in IT systems development, including information systems (eg. Robey and Farrow 1982; Ives and Olsen 1984; Hirschheim 1985; Baroudi *et al.* 1986; Tait and Vessey 1988), DSS and expert systems (eg. Eierman *et al.* 1995) and agricultural technology development (eg. Ison 1993; Jiggins and de Zeeuw 1992; Jiggins 1995). These studies have focused on the effects of participation within IT systems development on various individual, group and organisational level criteria, such as attitudes, behaviours and performance.

Expected benefits of participatory system development and participatory R&D cited in these studies include: providing a more accurate and complete assessment of user information requirements; prevention of costly system features that are unacceptable or unimportant to users; greater user acceptance, support and ownership of the technology innovation; improved user understanding of the technology development; heightened perceptions of the technology as valid, credible and persuasive; providing an arena for bargaining and conflict resolution about design issues; and contributing to the political climate or conditions conducive to meaningful utilisation.

Although these studies support the benefits of stakeholder participation to use and adoption of R&D outcomes, this has been largely through discrete factors (eg. system quality, user satisfaction) related to the use of the technology innovation, rather than from the wholesale implementation of participatory approaches (Greene 1988b). Many of the theoretical and operational aspects of participation are poorly

understood, eg. stakeholder definition and selection, and the nature and role of meaningful participation (Greene 1988b; Mark and Shotland 1985, Hartwig and Barki 1994). These are significant issues for the participatory design and management of development processes for IT applications. As identified in Bellamy and Lowes (1995), a new approach to R&D involving the development of IT innovations is required which includes: (i) IT developers clearly defining their target audiences early in the development process, and focusing on evolving and on-going groups; (ii) the process being flexible enough to account for, and accommodate, changing stakeholder objectives and requirements; and (iii) a flexible and adaptive systems development approach which can evolve with the stakeholders' institutional situations and the decision-making environments over time.

Evaluating effectiveness of IT system development and use

The adoption of a suitable implementation strategy or process is critical to ensuring the effectiveness of any new information technology (eg. Ives and Olson 1984; Lyytinen and Hirschheim 1987; Willcocks and Margetts 1994; Angehrn and Jelassi 1994; Eierman *et al.* 1995). Key factors influencing effective implementation include: top management commitment; organisational culture; user participation in system design and development; a system evolution strategy; and the social context of implementation (eg. technological readiness of the target stakeholder organisations and the wider cultural and national setting within which the organisation operates).

Organisational, social and political rather than technical factors, are identified as the predominant influences on effectiveness (eg. Willcocks and Margetts 1994; Gill 1995; Eierman *et al.* 1995). The emergent perspective in IT theory is that "the uses and consequences of information technology emerge unpredictably from complex social interactions ... [and the] dynamic interplay between actors, context and technology" (Markus and Robey 1988). In this context, a R&D paradigm proposed by Bellamy and Lowes (1995) places greater emphasis on the effectiveness of an IT innovation in terms of a process tool rather than technology success. That is, a more holistic implementation approach is required that facilitates intangible outcomes (eg. stakeholder learning processes and behavioural change, improved stakeholder relationships and interaction processes, broader societal benefits) as well as tangible outputs (eg. improved technical capacity and institutional

arrangements) at a range of operational levels and time frames. Within this paradigm, evaluation should be continuous and integral to the IT system development process as an iterative activity that is influential on the regional resource use planning process. This in turn must feed back to influence the IT system design and development.

3.2.2 Regional aspects of ecosystem management

Ecologically sustainable development encompasses three essential elements: the whole (total) system—the human and natural systems and the interrelationships between them; the maintenance of the health of those systems; and their spatial and temporal linkages (see Dovers and Handmer 1995). Ecosystem management is widely argued to offer a method that addresses those elements in order to achieve societal benefits of natural resource use while concurrently limiting environmental degradation and preserving ecosystem integrity (eg. Slocombe 1993; Montgomery 1995). An ecosystem approach to management is a key guiding principle, either explicitly or implicitly, to all integrated approaches to resource management and planning.

In Australia, the principles of ecosystem management are embodied in the Intergovernmental Agreement on the Environment (DPMC 1992), which has been agreed to by all levels of government and signed by all States and Territories (see subsection 4.2.3). As a means of achieving ecologically sustainable development, the IGAE commits all parties, firstly, to pursuing the effective integration of ecological and environmental considerations into governmental decision-making processes at all levels, and secondly, to ensuring policy and program implementation adopts four principles: the precautionary principle; intergenerational equity; conservation of biological diversity and ecological integrity; and improved valuation, pricing and incentive mechanisms.

An essential condition for implementing these principles is an efficient, diversified and ecologically sustainable economy (Young 1993; 1995). These and other principles are examined below.

The precautionary principle

The IGAE (s3.5.1) outlines the precautionary principle thus:

Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: (i) careful

evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and (ii) an assessment of risk-weighted consequences of various options.

The precautionary principle derives from the need for foresight rather than reactive management. It is about how to act responsibly in the face of uncertainty and lack of full scientific knowledge (Young 1993, 1995; Norton *et al.* 1996). Scientific understanding of most ecosystems is currently insufficient to permit either reliable, non-trivial predictions of impacts or the development of operationally-effective management guidelines in the short to medium term (Norton and Nix 1996).

The precautionary principle guides most recent international agreements on the environment (eg. the Rio Agreement; Agenda 21; Convention on Biological Diversity), and is both explicit or implicit in Australian environmental policy (eg. the National Strategy for Environmentally Sustainable Development; National Strategy for the Conservation of Australia's Biological Diversity; the Draft National Strategy for Rangeland Management, etc.). In a recent literature review, Dovers (1996) found that the precautionary principle is generally interpreted as implying that:

- uncertainty is pervasive and should not be an excuse for delaying environmental protection;
- prevention and anticipation should replace reaction; and
- the burden of proof moves from the environment or its advocates, to development proponents.

In the literature, the principle applies mainly to natural resources and ecosystems. It could, however, equally be applied to social and cultural impacts to existing and future generations.

Dovers and Handmer (1995) have identified limits to using the principle in practice, particularly in respect of the precise meaning of elements such as “serious or irreversible damage”, “scientific certainty”, “careful evaluation” and “risk-weighted consequences”. Nevertheless, the precautionary principle is currently being used as a means to inform policymakers and resource users about obligations to existing and future generations, and the consequences of a decision or policy in relation to natural resources and ecosystems (Young 1995).

Inter-generational equity

Inter-generational equity refers to the belief that the present generation has an obligation to ensure that the health, diversity and productivity of natural and

cultural resources are maintained or enhanced for the benefit of future generations (Young 1993, 1995). In an extensive review of the existing literature, Young (1993) concluded that the concept requires the citizens of today to: (a) live within and only off their income, and (b) maintain equivalent opportunity sets that is, to provide future people with an endowment equivalent to that which they received. Five strategies for the implementation of inter-generational equity in decision-making have been identified (Young 1993):

1. Maintain an efficient economy (enrich the present generation)
2. Maintain natural capital
3. Recognise the precautionary principle
4. Still take decisions
5. Increase ecological, social and economic diversity.

As there are no effective methods for measuring the stock of natural capital or how to identify many potentially adverse irreversible changes, reliance will need to be placed on a wide range of policy approaches and institutional arrangements that are conducive to the maintenance of inter-generational equity (Young 1995). In this situation, Dovers (1996) advocates strong statutory and institutional arrangements to better provide for policy persistence, longevity and mandates, and open evolutionary policy processes that allow and encourage policy learning and adaptation.

Conservation of biological diversity and ecological integrity

The concept of sustainable yield needs to be broadened for use in regional resource use planning to include the protection of biological diversity and the maintenance of ecological integrity. These concepts are fundamental to the achievement of ESD at a regional level because of their importance to the achievement of inter-generational equity (eg. ESDWG 1991a) and society's health (eg. ESDWG 1991a; RAC 1993a; Morton *et al.* 1996).

The relationship between native vegetation clearance, habitat loss and fragmentation, and biodiversity decline has been increasingly recognised (eg. DEST 1995a). Notably, the importance of maintaining biodiversity has been identified in the National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth of Australia 1995c):

Maintaining biological diversity is much more than just protecting wildlife and their habitats in nature conservation reserves. It is also about the sustainable

use of biological resources and safe-guarding the life-support systems on Earth.

Sattler (1993) has stressed that biodiversity should be considered not only in relation to taxonomic distinctiveness, but also to environmental and ecological distinctiveness. He proposes a conceptual hierarchical framework that recognises four levels of environmental variation—landscape, ecosystem, species and genetic diversity in defining biodiversity.. In this framework, conservation strategies need to incorporate the protection of biodiversity at each level through a system involving protection of reservations and other lands.

The National Biodiversity Strategy also identifies several processes likely to lead to a decline in biological diversity in Australia: excessive clearance of native vegetation, including habitat fragmentation; habitat modification, including land degradation and pollution of waters; introduction of alien species, such as weeds, rabbits and foxes; inappropriate fire regimes; and climate change, including the enhanced greenhouse effect (Morton *et al.* 1996). The maintenance of ecological integrity is important for ensuring the regeneration of renewable natural resources and maintaining the natural environment's capacity to absorb and cleanse waste products (ESDWG 1991b). The concept of ecological integrity has been used in various contexts including: (i) identifying and developing ecologically favourable management regimes; and (ii) the ability of ecosystems to maintain their organisation (habitat, complexity and biological diversity) over time, in which case it is commonly associated with thresholds of environmental change (RAC 1992c).

In the context of this review, the protection of biodiversity and the maintenance of essential ecological processes are underpinning principles in attaining ESD. All spheres of government in Australia have made public commitments to that goal (see section 2.1). This commitment is reflected in the 1993 findings of the House of Representatives Standing Committee on the Environment, Recreation and the Arts (HORSCERA 1993:xiii):

... three fundamental elements emerged as essential for action to maintain biodiversity and ecological processes: a bioregional approach to planning; an ecological representative reserve system; and community involvement.

Given the extent of Australia's biodiversity at risk, the policy, planning and management approach for natural resource systems needs to give strong

consideration to the medium to long term impacts of regional resource use decisions (DEST 1995a).

Limitations of traditional approaches

Various key technical limitations with existing scientific methods and institutional arrangements for the implementation of ecosystem management approaches have been identified:

- the lack of agreed operational definitions for basic terms such as sustainability and biodiversity (eg. Cortney and Moote 1994; MacIntyre and McIvor 1998);
- the emergence of a new paradigm of ecosystem management is being constrained by lack of ecological theory, methods, and data, such that it is apparent that many problems are intractable in the short to medium term (eg. Cortner and Moote 1994; Norton and Nix 1996). The literature espousing an ecosystem management approach was found by Cortner and Moote to be characterised by: requirements for planning on the scale of landscapes or catchments (ie. thousands of hectares); long term planning (in the order of hundreds of years); and the development of a regional scientific database. In most cases, however, there are no methods, data or financial resources to meet such requirements.
- approaches currently used to evaluate environmental impacts are inadequate for implementing ecosystem-orientated land management, as environmental concerns related to land management are generally addressed in a crisis mode or on a site/species-specific basis (eg. Montgomery 1995).

In the ESD context, science, policymakers and resource users need to accept three realities: constant change; ever present uncertainty and ignorance; and the increasingly stressed interdependence between humans and the biosphere (Dovers and Handmer 1995; Dovers 1996). This requires a paradigm shift in the way both scientific R&D and regional resource use planning and management practices are undertaken. Both need to be more adaptive, flexible and inclusive.

Adaptive management of complexity

In recognising the complexities in natural and human systems, the newly emergent scientific paradigm of integration focuses on evolutionary and adaptive management (eg. Gunderson *et al.* 1995a). This paradigm is characterised by complex systems behaviour, discontinuous change, chaos and order, self-organisation, nonlinear system behaviour and adaptive, evolving systems (Holling 1995). Under

this paradigm, the management of complex regional ecosystems will need to involve active adaptation and learning in dealing with uncertainty; that is learning to manage by change rather than by simply reacting to it (Gunderson *et al.* 1995a). This fundamental shift in the management paradigm has meant a re-evaluation of the function of planning and a search for alternative processes that are better at generating learning and meaning (Westley 1995).

Traditionally, science has been seen to inform rational decision-making processes through providing quantitative and objective information. Acceptance of the adaptive and evolutionary management paradigm has profound implications for the role of scientific knowledge in regional resource use planning processes. Zandbergen and Petersen (1995) argue that this role will not be so straightforward:

First, decisions are influenced by a variety of cultural, social and political factors, and scientific knowledge is only one more piece of information to be weighed against a host of other considerations. In addition, scientific knowledge itself is the outcome of a consensus building process among scientists from different disciplines who are trying to interpret complex ecological systems. Finally, current scientific attempts to describe and predict the behaviour of our complex social, economic, and ecological systems are not adequately considering complexity, and the traditional approach to collecting and using scientific information is likely to be ineffective.

Crisis, conflict, and decision gridlock common to regional resource planning and management can be broken when the issue is seen not as a procedural one of institutional control, but as a strategic one of adaptive policy management, of science at the appropriate scale, and of understanding human behaviour (Holling 1995). This approach requires integrated, flexible and adaptive policies, not piecemeal rigid ones; management and planning for learning, not simply for economic or social product; monitoring designed as part of active interventions to achieve understanding and to identify remedial responses; and citizen involvement and partnership to build "civic science", not public information programs to inform passively (Holling 1995).

Gunderson *et al.* (1995a) found that the critical barriers to, and bridges for, maintaining or restoring the ecological attributes and institutional flexibility that underlie and provide services to the people and activities in a region fall into three categories: (i) the ways in which humans interpret and understand nature and resources; (ii) the design and practice of human institutions; and (iii) the interaction between

people and ecosystems. In recognising how complex the natural and human systems of interest and their interaction really are, science and technological information are essential in informing sustainable and equitable political and social processes. In this situation, a multi-stakeholder approach is required in which scientific judgments become part of the negotiation and bargaining process in an attempt to deal with inherent uncertainty (Zandberger and Petersen 1996; Bellamy *et al.* 1996). However, in implementing such approaches, it is essential that all stakeholders recognise the experiential nature of these processes, and that everyone, including researchers, is going through a learning process (Zandberger and Petersen 1996).

3.2.3 Social planning and assessment at the regional level

Social planning needs to be an integral part of regional resource use planning. In the regional context, it can be defined as any planning that meets the social goals of communities, interest groups and individuals within the region. It is usually based on the four social justice principles of access, equity, rights and participation. Social planning is often closely associated with planning for social infrastructure. Jones and Thornthwaite (1994:5) consider that planning for social infrastructure should broadly comprise human services and facilities, social aspects of human settlement/land use patterns and social development processes.

Regional social planning needs to be based on clear social assessment—the process of data collection, research and analysis to determine the social issues that need to be addressed. Social assessment also relies on the application of social theories that are critical in establishing practical strategies to resolve key social issues (QDFSIA 1995:7). The goal of social assessment is to anticipate and describe the social effects of change, so that they can be managed in ways that maximise positive and minimise negative social impacts. Involving all stakeholder groups in this process is critical if the distribution of social impacts and benefits arising from land use change are to be equitable. Ideally, it should also be a proactive process, enabling planners to plan for change rather than responding to the social impacts of ineffective social planning (Taylor *et al.* 1990).

Despite their central role in integrated planning, social aspects of regional planning have tended to be overwhelmed by biophysical and economic issues. Dale *et al.* (1997) identifies a wide range of factors contributing to the limited development and low profile of social impact assessment within impact

assessment practice. These can be applied to the incorporation of social issues within regional planning.

The rationalist nature of planning practice

As mentioned in section 3.1, planning and impact assessment practice evolved from schools of planning theory which held the view that centralised planning agencies were best placed to determine planning goals and to apply technological solutions to implement these goals. Shrader-Frechette (1985) considers that proponents of this view believe that all that is needed to solve environmental problems is more and better technology, ignoring the potential social, ethical and political solutions.

In reality, both urban and regional planning practice frequently remain the domain of central planning agencies (see chapter 5), though the opportunities for public participation have improved in recent years. Regional planning has sought largely to rely on the physical and engineering sciences, limiting the importance of community participation. Without clear mechanisms for determining community values and perceptions, many regional social planning activities tend to be restricted to limited needs assessment processes which are based on the predominant values or functions of the planning agencies.

Disciplinary bias in regional planning

Even when restricting its consideration to technical issues, regional planning practice has tended to focus almost universally on the biophysical and engineering disciplines (see Cowell 1996), showing a marked disciplinary bias against the social sciences. Burdge and Opreyszik (1994) have shown that what they term “disciplinary chauvinism” can affect every aspect of planning, thereby constraining the quality of advice provided to decision-makers. This disciplinary imbalance is clearly visible in the structure of teams established to undertake regional planning (Dale *et al.* 1997; Kellow 1993). Planning teams are often led by professionals with physical science and project management backgrounds, with social assessment and cultural heritage assessment practitioners usually relegated to the role of sub-consultants.

Difficulties in defining social issues and human values

Perhaps one of the reasons for the physical sciences receiving greater attention than the social sciences in planning is the perception that ‘hard’ data are more useful in prediction than ‘soft’ data. This perception undersells the role of scientific rigour within both the physical and the social sciences. Variability exists in

social and physical environments, and research methods established in these sciences are based on the same statistical methods for measuring variability and for establishing predictive models. The perception that social issues are difficult to define reflects the fact that resourcing for planning research has traditionally favoured the physical sciences. This perception has also made it difficult for groups with concerns about planning outcomes to challenge defective development decisions on the basis of poor social planning. As a result, there has been limited application of sound social theory and well established social planning methods in challenging poor planning and development assessment processes.

Because social issues are dynamic and involve diverse values and needs, they are often represented through a mixture of qualitative and quantitative methods. This can often cause problems where there is a perception that validity should be established according to scientific or technical criteria that can be objectively compared. Social research generally recognises that attitudes and values are legitimate drivers within the process of planning by negotiation, and that the degree of legitimacy accorded to the measurement of values depends on how effective and comprehensive the dialogue with stakeholders actually is (QDFYCC 1996a:8).

3.2.4 Economic planning and assessment at the regional level

The following discussion canvasses aspects of the literature from the agricultural and resource economics domains that provide insights for improving land use planning practices within a rangeland and regional context. It is by no means a definitive statement of the application of economic thought or practice to regional planning issues. Indeed, the material canvassed largely ignores much present and past theory and practice in the specialist regional economic domain. It does this for two reasons. This literature, which has historically focused on industrial issues such as factory location, regional growth and employment patterns and infrastructure provision, has less relevance to resource use aspects of regional planning. Much of the economic literature on regional science and planning is excessively technocratic or takes limited account of the complexity of rangeland regional ecosystem processes and the diverse stakeholder interests that apply to them. Thus, the following seeks to make sense of how some related and unrelated topic areas might be drawn together to provide an insight into how economic theory and methods might

be harnessed to support improved regional land use planning practice.

In considering the agricultural, environmental and resources economics literature relevant to regional land use planning, 10 themes can be extracted:.

1. Property adjustment pressure/viability
2. Regional/industry adjustment pressure/viability
3. Natural resource economic theory and practice
4. Benefit–cost analysis
5. Valuation of environmental values and impacts
6. Land and water resource degradation
7. Restoration technology economics
8. Wildlife and feral animal values and costs
9. Recreational use of natural resources
10. Sustainable resource management, ecological economics.

Innovative economic assessment techniques and procedures related to these themes and which may be applied to regional resource use planning are detailed in subsection 6.1.4.

The differentiation of these themes necessarily involves some ill-defined boundaries and recognises that naturally strong linkages exist between them (illustrated in Figure 1). Also, the identification of themes attempts to reflect both historical patterns of scholarship in economics and the industry and social contexts within which this might have been occurring. For example, following a period of relatively sustained prosperity for Australian agricultural industries and their constituent enterprises, the late 1960s and early 1970s witnessed a significant deterioration in rural terms of trade and major structural problems for some rural industries and the regions and communities on which they were centred (eg. wool and beef). Small property size and related (efficiency and welfare) concerns, in turn, were relevant to issues surrounding rangeland resource degradation. Alternative resource uses (eg. recreation, tourism, wildlife harvesting) and degradation of environmental resources became a central focus of the (then) growing field of environmental economics. Externality-induced market failure and restoration technologies were best judged according to benefit–cost analysis (BCA) techniques. However, valuing the (largely) unpriced benefits of restoration initiatives and selection of appropriate discount rates was (and remains) a barrier to the effectiveness of BCA in this context.

As society's understanding and appreciation of the complexities inherent in sustainably managing natural resources for multiple ends increases, so too does the scope and complexity of the economic methods potentially employed to address them. With this has emerged a substantial interest in sustainable resource use and new paradigms of ecological economics (MacLeod 1998).

Economics and resource allocation

Across all of these themes, it is critical to appreciate that the opportunities and limitations of applying economics to regional land use planning arise from its primary focus on allocation. As such, significant attention has been given by economic scholars to various theoretical and operational techniques that seek to place values on environmental goods and services. This concentration is warranted because conflicting or multiple uses of natural resources within a regional context invariably involve potential trade-offs between production, conservation and other uses. Most non-production land uses, however are not usually revealed in formal markets (MacLeod 1998).

As fundamental to allocation decisions is the issue of how much of a particular good or service is demanded, and which particular attributes of goods and services are preferred over others. To a lesser extent, the distribution of these demands and factors of production are also a focus of economic study. This focus will ideally extend to also encompass environmental goods and services (eg. water quality, aesthetics, wildlife and their habitat, wilderness, etc.). That is, like most goods and services, different aspects of the natural environment are scarce. Therefore, they also have economic values that will be affected by most decisions that impact on the allocation of resources within the community (MacLeod 1998).

Although these kinds of issues can be addressed conceptually at a range of scales from the individual to the global population, most analyses in practice tend to be focused on groups corresponding roughly to the 'national interest' (ie. the Australian community). Economic assessments also typically seek to reduce complex social and environmental issues to some simple common yardstick (money). The rationale for this lies within the belief that doing it will allow individual (eg. land managers) and aggregate decision-makers (eg. policymakers) to more easily and powerfully compare the *benefits* of achieving a particular resource allocation with the *costs* incurred. Benefits are ideally assessed in terms of private or social *willingness to pay* and the value of

any foregone options typically are expressed as economic *opportunity costs*. This, in turn, is argued to provide a *rational* basis for making important land use decisions that compare or incorporate financial and environmental impacts (NSWEPA 1993, 1995).

The willingness-to-pay concept is underpinned by the fact that economic benefits constitute outcomes of actions which increase the welfare of individuals and/or the general community. Specifically, these represent the values that are placed on different goods and services and should be reflected in the willingness to pay for them in a competitive market. This, in turn, is conventionally measured as consumers' surplus, or the area under the market demand curve for those goods and services between the maximum price consumers would be prepared to pay and what is actually paid. A related concept is willingness to accept compensation for losses of goods and services, which in perfect markets should provide identical estimates of benefits (maximum willingness to pay equals minimum willingness to accept). Economic valuation methods typically seek to construct demand curves for goods or services of interest. For goods and services which do not trade in formal markets, economic valuation techniques seek to estimate willingness to pay or accept compensation through observation of surrogate markets or constructed markets. Economics traditionally measures costs as *opportunity costs*. For goods and services these constitute the earnings (opportunities) that are foregone by using the resources in a particular way as opposed to the best alternative use (MacLeod 1998).

3.2.5 The integration of environmental, social and economic issues

The concept of sustainable development endorses the notion of the interrelatedness of environmental, economic, social and political aspects of resource use (see, eg. UNCED 1992). Decision-making consistent with ESD will require a sound understanding of resource capabilities, community values, attitudes and preferences, and the losses and benefits associated with particular choices (RAC 1992c). In this context, there has been widespread support for the replacement of fragmented and frequently reactive sectoral approaches to natural resource use and management planning with more flexible, anticipatory, and adaptive ecologically-based approaches that focus on both integration and sustainability, and reflect the complexity and interconnectedness of management systems. RAC (1992c:15–16) notes, for example:

The need for an integrated approach to resolving resource use issues is now widely accepted among policy makers. It is becoming more widely understood that ecological systems underpin economic systems and human activities influence the capacity of ecological systems to maintain such activities. Similarly, it is becoming better understood that consideration of social and cultural issues is important because achieving ESD will require policies that take account of people's attitudes and behaviour.

Integrated approaches are described in the literature by a number of terms including integrated resource management (eg. Lang 1990a,b; RAC 1993a; Grinlinton 1992), integrated environmental management (eg. Brown 1994; 1995; Born and Sonzongi 1995; Margerum 1996), integrated catchment management (eg. Mitchell and Hollick 1993; QDPI 1993a; Syme *et al.* 1994), watershed management (eg. Mitchell and Shrubsole 1992), environmental planning (eg. Armitage 1995), and bioregional planning (eg. Sattler 1993; Lambert *et al.* 1996).

Lang (1990b) defined the sorts of circumstances requiring integrated resource management and planning approaches as "where problems are highly complex, interests and objectives are numerous and in conflict, information and knowledge are quite incomplete, ends and means are ambiguous, control is fragmented and the external environment is in flux". Thus, integrated approaches must incorporate a holistic resource management ethic characterised by "diverse sets of stakeholders coming together, sharing information and perspectives, fostering mutual understanding, and developing a holistic yet targeted approach to managing an environmental system" (Margerum 1996).

Frameworks for integrating environmental, economic and social issues in resource use planning

The most commonly used internationally accepted methods for assessing the potential of land for one or more uses are based on the standard guidelines of the Food and Agriculture Organization's Framework for Land Evaluation (FAO 1976). Rather than a classification system, the framework provides a set of methodological guidelines for evaluating a particular area of land in terms of its limitations to land use. One of the key principles to the approach is that land suitability refers to use on a sustained basis with reference to the physical, economic and social context of the area concerned. The limitations to land use are, however, generally assessed in terms of on-site biophysical criteria only, and important socio-economic factors and off-site implications, including

cumulative effects, influencing the sustainability of a regional resource use system are often not considered.

In response to these deficiencies, various frameworks that take a more integrated regional approach to evaluating environmental, economic and social aspects of resource use management have been proposed. These include: the Framework for Evaluating Sustainable Land Management (FAO 1976, 1983; Smyth and Dumanski 1993); the Forest Ecosystem Management Assessment Team (FEMAT 1993); the Pressure-State Response Framework (OECD 1992; DPIE 1994); Strategic Environmental Assessment (Therivel *et al.* 1992; Court *et al.* 1994; Glasson *et al.* 1994); and approaches based on threat identification using indicator groups (Gallopin 1994). Unfortunately, little progress towards a more cross-disciplinary synthesis of regional problems appears to have been made.

3.3 Regional Resource Use Planning Negotiations and Procedures

Section 3.1 stressed the need for regional planning to recognise that regions comprise a plurality of stakeholder groups with both competing and compatible objectives and priorities. Many of these stakeholders have varying roles, rights and responsibilities in relation to land ownership, planning and management. Consequently, regional planning processes need to be underpinned by an effective framework for facilitating negotiation among these stakeholders. These negotiations need to focus on achieving natural resource management regimes that make appropriate trade-offs between the competing social, economic and environmental needs of these stakeholders.

Dorcey (1986) and work undertaken in Canada's Pacific North West by the Westwater Research Centre at the University of British Columbia succinctly draw out issues relating to the establishment of an effective framework for the negotiation of regional agreements on the management of natural resources. An outline of these issues follows.

3.3.1 Informing and preparing for the negotiation process

Dorcey (1986:79) claims that if bargaining and negotiation are to be productive, then the stakeholders or participants must be well informed. Information that the groups involved must have includes: (i) technical and scientific data and knowledge concerning regional resource management; (ii) major

development plans and threats to resource sustainability in the region; (iii) development impacts on the community and its resources; (iv) the socio-cultural landscape within the region; and (v) knowledge of how to become involved in planning processes. Ownership and control over this type of information means that groups will be able to bargain from a position of strength and knowledge.

Being informed, however, is not the only preparation that stakeholder groups need to make to achieve their preferred outcomes in resource use negotiations. Fisher and Ury (1981:13–14) stress the importance of preparing to enter into the negotiation process, and they suggest stakeholder groups should apply three stages in doing so: analysis, technical planning and discussion. The analysis stage attempts to diagnose the situation and involves gathering information, and organising and thinking about it (Dorsey 1986). In doing this, planners for stakeholder groups need to be able to consider partisan perceptions, hostile emotions and unclear communications, as well as identify community interests and those of the other side. The groups must note the options already available and identify any criteria already suggested as a basis for agreement (Dorsey 1986).

During technical planning, the same issues are dealt with a second time, both to generate ideas and to decide upon a course of action. Possible solutions are theorised, objectives prioritised and their feasibility determined (Dorsey 1986). Each stakeholder group needs also to generate additional options and criteria for deciding among objectives. Throughout the analysis and planning phases, each group needs to address three critical questions: (i) how can its goals be best achieved?; (ii) how can the other parties goals be best achieved? and (iii) how can the group's goals be best achieved in the light of agreements that seem possible (Dorsey 1986).

Finally, in discussion, the negotiating parties communicate back and fourth, looking towards agreement, using these questions as an agenda. Differences in perspectives and feelings, and difficulties in communication can be assessed and addressed (Dorsey 1986). Both parties can then jointly generate options that are mutually advantageous and seek agreement on objective standards for resolving opposed interests (Dorsey 1986).

Dorsey (1986:113) contends that many stakeholder organisations are not well prepared for bargaining. In the past, descriptive knowledge has been overemphasised and functional knowledge neglected. Scientists have generally not been employed by

stakeholder groups to provide important background to the bargaining process. While more scientific information has become available in recent years, it often does not always meet the needs of bargaining. To address these deficiencies he suggests that a series of interrelated reforms is needed to strengthen the bargaining process. To improve their involvement, stakeholder groups need to: (i) develop an understanding of the bargaining processes of governance and the need to prepare for participation in them; (ii) focus attention on the need for functional knowledge and the opportunities for generating it through desk analyses and experimental research; (iii) develop techniques of planning that can be used by bargaining participants, both individually and jointly; (iv) develop techniques and processes for research scientists to be more intimately engaged in the analytical and management processes of governance; and (v) develop techniques and processes for stimulating the systematic and constructive challenging of technical and value judgments underlying the arguments of parties to the bargaining.

3.3.2 Participation and representation

As the legal rights of key groups within the community improve, so do their opportunities to get involved in the bargaining process within and outside government organisations (Dorsey 1986:115). The equity of bargaining processes is likely to improve as the mainstream planning system becomes more open to public participation, and as dispute resolution processes become more cognisant of stakeholder group concerns. In recent years, opportunities also have significantly expanded for government agencies to also become involved in bargaining (Dorsey 1986:133).

However, while the political environment for stakeholder participation in negotiations and the mainstream planning system has improved, Dorsey (1986:134) considers that a lack of community-based leadership has frustrated the process, restricting the community-based strategic planning needed to meaningfully inform the negotiation process. This further justifies the development of the strategic planning capabilities of less powerful participants (eg. marginal stakeholder groups and small government agencies; Dorsey 1986:134). While sound community-based strategic planning will allow stakeholders to bargain for their aspirations, bureaucratic strategic planning will also make government leadership and accountability both possible and meaningful (Dorsey 1986:134). Improving the bargaining ability of the bureaucratic agencies will provide an effective advocate for

stakeholder concerns within higher levels of the negotiation process.

Governments need to reorganise the hierarchy of bargaining and negotiation processes so that the higher levels establish the parameters for bargaining at the lower levels (Dorcey 1986:134). The responsibilities of leadership throughout the hierarchy must be clearly established so that bargaining is guided by and ultimately accountable to elected politicians (Dorcey 1986:134). To better inform the process, the responsibility for bargaining and negotiation within government should therefore be devolved to regional bureaucratic levels.

In designing administrative arrangements to support equitable bargaining and negotiation, it is important that some thought be given to resourcing stakeholder groups to allow them to participate effectively. The concept of participant funding has previously been used to resource stakeholder groups in Australian regional planning processes (see subsection 4.3.1). However, where governments have not been committed to the concept of actually empowering stakeholder groups to negotiate over resource management issues, groups receiving participant funds may feel betrayed, seeing their participation as window dressing for centralised planning (see Howlett 1996).

3.3.3 Improving the productivity of negotiation

Dale (1991:20) suggests that for stakeholder groups to be competent and effective at bargaining and to achieve their goals and aspirations, they need to: (i) be able to effectively use information as a bargaining base; (ii) establish information sharing and support networks and credibility with other communities, industries, stakeholder groups and even government departments that are able to add substance to their bargaining position; and (iii) be able to effectively communicate in the bargaining process, either through organisational training, employing a facilitator or negotiator to conduct negotiations competently, or temporarily enlisting the services of government agents to provide assistance in bargaining.

Tegg (1990) has released training material to assist communities to negotiate with external resource developers over resource use issues. Such material is important for non-government stakeholder groups, because weak communication, challenging and bargaining skills can seriously undermine potential productivity. Dorcey (1986:162) considers that improvements need to be made in communicating

effectively, challenging constructively and bargaining successfully.

3.3.4 Changing the negotiation environment

Regional planning already occurs within an environment of government administration and industry involvement that often does not fully encourage stakeholder participation. Changes in the bargaining environment are often regional, national or global rather than local, and they tend to be beyond the control of individual communities or stakeholder groups. Stakeholder group commitment (through lobbying, lead by example, etc.) to fair representation in the existing planning process has, nevertheless, sometimes generated change in the administrative structures and the overall environment in which planning occurs. The trend towards planning by bargaining is a general one within society. Indigenous minorities across the globe, for example, have moved towards better political representation within planning processes (see Jull 1981; Jull and Roberts 1991).

Institutional arrangements for planning, however, often have been developed with little explicit consideration of structuring them to facilitate bargaining, even though most resource use negotiations occur within this process. Dorcey (1986:146) recommends that new arrangements need to be developed to facilitate bargaining, because so far they have received little attention in government administration. On the other hand, Amin and Thomas (1996:255) outline how the governance of Denmark's economy has been shifting towards the democratisation and decentralisation of decision-making, the preservation of collective solidarities and an emphasis on inter-institutional dialogue. They consider that, under these circumstances, the state has shifted "towards relations of reciprocity and trust with other governance institutions". The Danish model offers some insights to challenge the more centralised models of governance for natural resources within Australia.

3.3.5 Regional plan assessment, monitoring and evaluation

It is important that regional level agreements reached via stakeholder negotiation are regularly monitored and evaluated in the same negotiatory spirit within which they were reached. Stakeholder groups should be directly involved in monitoring and evaluation, and negotiatory structures should be retained in appropriate forms once regional planning has been completed. Apart from building commitment to implementation, this enables trust and cooperation to

be maintained during ongoing resource management processes. The design of monitoring and evaluation programs should draw upon the extensive literature on evaluation (including *ex-ante* and *ex-poste* evaluations and continuous monitoring; Shefer and Kaess 1990).

There is considerable value in undertaking some form of *ex-ante* impact assessment of draft strategies arising from regional resource use planning processes. It can be used to reality test proposed strategies and to reduce any negative social, economic and environmental impacts that may arise from implementation.

Hill (1985) presents a wide group of factors that need to be considered in undertaking assessments and evaluations. He considers these to include: being able to deal with different stakeholder objectives; consideration of *ex-post* impacts; dealing effectively with uncertainty; providing distributional equity; working to appropriate time lines; and comprehensiveness. For best results, institutional arrangements for plan monitoring and evaluation should be negotiated before the completion of any planning process (eg. see SEQRCC 1995).

3.4 Participation Within Regional Stakeholder Groups

The community development and public participation literature deals with a number of factors that are likely to lead to improved participation of constituents within stakeholder groups. These factors are not only important in ensuring equity within regional planning processes, but also in securing long-term backing of agreements reached at the regional level. Poor participation within stakeholder groups could undermine the effectiveness of regional planning outcomes, even if all stakeholder groups are represented during negotiation.

3.4.1 Establishing and maintaining a stakeholder group mandate

Empowerment of individuals and sub-groups to participate in the structures and processes of their representative stakeholder groups is critical to establishing vital and effective stakeholder representation in regional negotiations. Senge (1992) argues that empowering individuals without effort to maintain a clear alignment to the group can result in increasing tensions and conflicts within the group, lessening their effectiveness in the regional negotiation process. Chamala (1994:11) considers that this reinforces the need to update team-building

activities and the ongoing development and refinement of a shared corporate vision.

Establishing and undertaking team activities to maintain a shared corporate vision is critical to stakeholder groups retaining a mandate to operate within regional negotiations. Stakeholder groups often may mobilise over a short period as a result of a key land use or development issue, but fail to maintain their mandate by continuously 'working their constituency'. This means that group leaders fail to regularly reassure constituents that their interests are being represented. These activities are critical in providing representative leaders with the confidence they need to take actions or to make commitments in regional negotiations. Limited efforts to raise and maintain a mandate may result in some constituents distancing themselves from agreements negotiated by their representatives, or even breaking away and establishing their own stakeholder groups.

3.4.2 Equity within stakeholder groups

Equity issues (see subsection 3.5.2) do not simply apply to ensuring access of all stakeholder groups to the regional planning or negotiating table. The validity of any stakeholder group's involvement equally depends on it having equitable representation among its members, further ensuring that the group holds a mandate. There are many examples of inequitable involvement within stakeholder groups (eg. female producers finding barriers in producer groups, particular Aboriginal language groups securing inequitable representation within representative bodies established under the *Native Title Act*, etc.).

While many commentators have examined barriers to equitable participation within planning and policymaking processes at the stakeholder level (eg. see Boesveld and Postel-Coster 1991:142), less attention has been paid to the difficulties faced by members within stakeholder groups. Some of these barriers include the gender and racial roles ascribed to particular constituents, political and educational differences, functional barriers arising from age and disability, physical barriers such as remoteness and isolation, and economic barriers arising from internal differences within the socio-economic position of stakeholder group constituents.

Inequitable representation resulting from these barriers can reduce the impact of regional planning outcomes. Disaffected groups can undermine resource management agreements reached. Appropriate checks and balances may not be built into strategies developed from regional planning,

rendering them difficult to implement. Critical resource management issues may not be identified and addressed. These barriers can limit constituent participation within stakeholder groups in a variety of ways. Economically disadvantaged constituents, for example, may not have ready access to communication technologies such as faxes and mobile phones. They may be unable to sustain the travel required to attend meetings. It is possible, for example, that entire communities within a region could be marginalised because of economic factors affecting their participation.

3.4.3 Empowering constituents within stakeholder groups

The effectiveness of stakeholder groups in negotiations depends on their ability to empower their constituents to play an active role in the group, rather than establishing structures and processes that limit innovation and the use of available expertise. Murrell (1995) identified six key methods that groups can use to empower their constituents: education, learning, mentoring/supporting, providing, structuring and actualising. The application of these processes by stakeholder groups may increase commitment from constituents as well as enhance team cohesion and effectiveness.

3.4.4 Equitable resourcing within stakeholder groups

As Murrell (1995) notes, equitable resource provision is critical in empowering individuals or sub-groups to participate effectively in stakeholder group processes. Community-based stakeholder groups are often resource-poor, and there are often limitations too to the support that they can provide individual constituents to participate. Even in these circumstances, however, there are several resource strategies that can be put into place to improve the participation of (particularly) marginalised individuals or subgroups. These may include simple arrangements such as alternating meeting venues across different parts of a region, providing transport sharing arrangements, consciously directing resource support to disadvantaged constituents, etc.

3.4.5 Appropriate administrative structures and executive membership

Equity and empowerment are important factors to consider in establishing structures for administering stakeholder groups. A range of incorporation options may be looked at by the group to ensure there is equitable involvement from various group factions. As in government parties, it may also be important for

some form of factional deal or ward arrangement to be established to equitably share the administrative and executive functions of the group. This ensures that particular factions are not disenfranchised from executive and management decisions, and that there can be more direct information flows to key group factions about regional planning activities.

3.5 Principles for Regional Resource Use Planning

In exploring the three core elements of regional planning in sections 3.2–3.4, a number of consistent themes or principles emerged. Our review has identified eight overarching checks or principles that need to be applied in judging whether or not regional resource use planning is working. These include ensuring that all elements of planning are adequate and adaptive and are implemented in a sustainable, accountable, equitable, integrated, effective and efficient way. In chapter 5, these principles will be used as checks to underpin an analysis of regional planning across Australia.

3.5.1 Sustainability

As discussed in chapter 2 and in MacIntyre and McIvor (1998), there is now a high acceptance of the need for resource use planning processes try to achieve sustainable land use outcomes. Thus, the concept is useful as a check within all elements of regional planning. The most significant problem in applying the principle of sustainability arises from the academic and public debate concerning how it can be measured or defined (eg. see Goodland and Daly 1995). Another problem has been that there has been limited integration of the concepts of social, ecological and economic sustainability. For the purposes of this review of regional planning, the Brundtland view of sustainable development is adopted. WCED (1987) defines ESD as that which “meets the needs of the present without compromising the ability of future generations to meet their own needs”.

3.5.2 Equity

Directly linked to the concept of sustainability are the concepts of equity and fairness. Syme (pers. comm. 1997) considers that, in an integrated catchment management context, the reason for identifying equity as a key principle is that, “however it is defined, (equity) is likely to be closely associated with an individual’s overall judgement of the inherent fairness of the ... process ...”. He also considers that “those people who for whatever reason do not see the

process as being a fair one are less likely to participate fully in the program” (Syme, pers. comm. 1997).

These issues and concerns equally lend themselves to analysis of structures and processes within regional resource use planning.

Equity considerations should be the overriding check in establishing structures and processes for negotiation among stakeholders, as well as participation within stakeholder groups. An inequitable planning process will not only influence the willingness of individuals and groups to participate in regional planning, but also will affect their commitment to implementation. It will also underlie the consequent social and economic impacts arising from implementation that are experienced by marginalised groups. Poor attention to equity issues will eventually undermine the long-term viability of the planning outcomes because of uneven development and the possibility that land use conflicts will emerge or re-emerge at some time in the future.

3.5.3 Accountability

Any regional planning process needs to be accountable to the stakeholders who have a legitimate role to play. The general need for governments to be accountable to their constituents clearly should be reflected in regional planning. In turn, the representatives of community-based stakeholder groups need to be accountable to the constituents of their groups.

3.5.4 Integration

Central to many of the problems faced so far by regional planning is the poor level of integration between disciplines, processes and institutional arrangements (eg. see Slocombe 1993:289). Poor integration results in inefficiencies and inequities, and ensures that regional planning favours, for example, economic rather than social or environmental objectives.

3.5.5 Adequacy

The concept of adequacy also needs to be applied in checking that technical, negotiatory and participative elements of regional planning are working. It asks whether particular measures are being applied at sufficient levels to get the job done. For example, a regional planning process may redistribute human services in a region to make access more equitable, and to improve the efficiency and effectiveness of the services delivered. This does not necessarily mean, however, that the total level of services provided is *adequate* to meet demand. The concept can also be

applied to the distribution of biogeographic reserves. While lands allocated may be appropriately located to protect biodiversity, they may be insufficient in area. Conversely, it is easy to consider how there could be adequate allocations of land in inappropriate or ineffective locations.

3.5.6 Effectiveness

Throughout regional planning, there is also a need to constantly check that the process is having effective and meaningful outcomes (and not just outputs such as planning documents). Most decisions about planning need to be made with the aim that they will result in substantive improvements in the way that natural resources or land are managed in the region.

3.5.7 Efficiency

Effective outcomes from regional planning should not be considered in isolation from their costs. The efficiency of outcomes can be measured both quantitatively and qualitatively. They represent the outcomes achieved for the inputs used during regional planning. The optimal mix of inputs and outputs is also an important consideration. Efficiency considerations provide an understanding of the relationship between inputs and outputs in regional planning. There are frequent examples of regional planners reducing measures for public participation on the presumption that it “costs too much” without adequate consideration of how much this may reduce the value of the outcomes achieved (see Howlett 1996). Susskind (1987) considers that swift outcomes often result in false hope because, if disputes are not fully resolved, they merely shift to another arena. On the other hand, public participation programs in regional planning may be applied in a non-strategic way, creating additional costs for limited outcomes.

3.5.8 Adaptiveness

Finally, regional planning processes need to demonstrate adaptiveness: a capacity to make strategic and operational change as changing circumstance or knowledge present themselves. Adaptiveness is critical in complex systems where our knowledge is continually improving, and where plan implementation can lead to unexpected consequences. Adaptiveness needs to be structurally and cultural built into institutional arrangements which support regional planning activities.

4. Institutional and Policy Arrangements for Regional Resource Use Planning

To underpin our review of regional resource use planning across Australia in chapter 5, this chapter explores the relevant institutional arrangements in place at the national and State levels. This provides a basis for comparison between the Commonwealth and the State positions, and within individual States and regions. Comparisons between the arrangements reached in Australia and other comparable countries are also made to strengthen our analysis.

The following discussion illustrates that there are numerous legislative, structural and administrative arrangements in place for regional resource use planning. These are highly fragmented into separate legislative and administrative arrangements, and support programs for various forms of regional economic development, regional social development and regional environmental management. The separate nature of these themes are reflected both at the State/Territory and Commonwealth levels. Arrangements in place at the Commonwealth level have been driven largely by the need for micro-economic reform and to respond to international commitments such as ESD, international conventions and Agenda 21. State-level arrangements are more predominantly driven by State imperatives of economic development or natural resource management.

Most of the institutional arrangements in place for regional planning tend to focus on centralised forms of land use planning, allocating the primary planning responsibility to particular agencies with specific agendas (eg. World Heritage Management Authorities, the Western Australian Conservation and Land Management Agency, etc.), or delegating powers to particular committees or boards with limits to their representativeness (eg. REDOs, RPAGs, etc.). There are few institutional arrangements in place which explicitly seek to facilitate equitable negotiations among all key stakeholder interests, and even fewer that allocate enough resources to ensure

that stakeholder groups are able to adequately represent their constituents.

The approaches to institutionalising regional planning taken in other industrialised countries, such as New Zealand, Canada and the United States are diverse, and present useful lessons for the analysis of circumstances in Australia. The United States has tended to be highly sector-based (eg. regional forest planning) or to vest regional (usually areas of high conservation value) planning power in specific regional authorities such as the Tahoe Regional Planning Agency. New Zealand has moved towards regional forms of government (ie. district and regional councils), while Canada has perhaps taken greater steps towards facilitated negotiation among key regional stakeholders. In Australia, regional forms of government such as regional councils are likely to receive limited political support. Regional planning authorities are likely to be tolerated only in specific purpose areas such as regions of world heritage significance. Aspects of the Canadian system could well be applied to establishing a more negotiatory framework for regional planning. Elements of all three systems, however, provide useful insights to possibilities for regional planning in Australian rangeland environments.

4.1 International Arrangements in Support of Regional Resource Use Planning

International processes that have promoted ESD principles globally have underpinned Australian government and industry moves towards better institutionalising regional approaches to resource use and management. These processes have resulted in the Australian Government signing a range of treaties, agreements, conventions and protocols. Although there is no express power for the Commonwealth to enter into treaties with other

countries, section 61 of the Constitution extends the power to negotiate and sign such treaties to executive government (Rigney 1993:12). However, an international treaty does not have domestic effect unless the Commonwealth passes enabling legislation. Where the subject matter of the such legislation is not supported by a particular head of power, the external affairs power of the Constitution provides the Commonwealth with the broad power to implement treaties which impose international obligations upon Australia as a member of the world community. This power also extends to legislation which deals with matters of international concern that have not yet formed part of an international treaty (Rigney 1993:12).

As a result, there is a range of legislative and administrative arrangements in place at the international/Commonwealth interface which together build a complex institutional framework supporting, both directly and indirectly, the establishment of regional resource use planning activities. A list of such agreements, conventions, treaties and protocols can be found in Duncan (1993:xii) and Machonochie (1996:16). Some that have a direct impact on regional planning include: the Convention for the Protection of the World Cultural and Natural Heritage, agreed in Paris in November 1972 and resulting in the *World Heritage Properties Conservation Act 1983*; the Convention on the International Trade in Endangered Species of Wild Fauna and Flora signed in Washington in March 1973; the Convention on the Elimination of All Forms of Racial Discrimination, agreed in 1969 and resulting in the *Racial Discrimination Act 1975*; the Convention on Wetlands of International Importance Especially Waterfowl Habitat, agreed in February 1971; the Convention on Biodiversity, ratified on 18 June 1993 and in effect by 29 December 1993; the Framework Convention on Climate Change; the General Agreement on Tariffs and Trade; and the United Nations Convention to Combat Desertification.

Of particular relevance to rangelands, Agenda 21 “addresses combined issues of environmental protection and fair and equitable development for all” (Machonochie 1996:16). Machonochie (1996:16) points out that this includes issues such as the planning and management of natural resources, combating desertification and drought, promoting sustainable agriculture and rural development, conservation of biological diversity and strengthening the role of indigenous people. Also, the overall objectives of the Convention on Biological Diversity are the conservation of biological diversity,

the sustainable use of its components and the fair and equitable distribution of benefits arising from the use of genetic resources. As a party to the convention, Australia has a responsibility for the conservation and sustainable use of its own biological diversity. Parties also have the responsibility to manage those of their own activities that may threaten diversity, regardless of where the effects might be felt (Preece *et al.* 1995:15). They are required to do this through the implementation of national strategies, plans, and programs for sectors such as agriculture, fisheries and forestry, and for cross-sectoral matters such as land use planning and decision-making.

4.1.1 New Zealand

The basis for regional planning in New Zealand was radically improved with the introduction of the *Resource Management Act 1991* (RMA). The Act represents New Zealand’s response to the Brundtland report and confers planning responsibilities upon two pre-existing authorities: regional councils, which have a major role in developing resource management policies and in the management of soil and water resources and coastal areas; and district councils, which are primarily concerned with managing land use within the regional policy framework (Dixon 1993:239). Both are elected at the time of local government elections via a ward system. District or unitary councils were established in areas where it was considered that the functions of regional and local government could effectively be blended into one administrative structure (Fitzgerald, pers. comm. 11/7/96).

Under the RMA, regional councils are required to produce regional policy statements that identify the key resource issues for the region, and to define policies for dealing with those issues. These statements are intended to reflect national environmental standards and regulations. They frequently include the identification of regional resource use issues and the establishment of a regional vision of sustainable resource management. There are statutory requirements for citizen involvement and *iwi* (Maori tribe) consultations (Furusetth and Cocklin 1995:184).

The RMA intends that these regional policy statements establish the framework within which local government strategic planning and development assessment activities occur. Regional policy statements may underpin the development of regional plans or regional coastal plans, and are taken into account in the development of district plans and subsequent assessment of development activities. In terms of development assessment, while district

council approvals focus on land use and sub-division consents, regional councils provide consents to take water and to discharge contaminants into water or air, or onto land (Morgan 1995:334). Some coastal development consents remain the responsibility of the Department of Conservation (Furuseth and Cocklin 1995).

Currently, all regional councils have officially declared their policy statements and many are seeking public comment on them (Morgan 1995:334). Furuseth and Cocklin (1995:181) consider that regional policy statements will be among the most important mechanisms through which principles of sustainable resource management will be implemented at the local level. They also consider that the devolution of responsibility for natural resource decision-making to the regional and local level is the legislation's real strength. Under former administrative structures, centralised government departments and legislative mandates largely pre-empted local decision-making on natural resource issues, despite the absence of well-defined national environmental policy. Within the general guidelines laid out in the RMA, this allows the councils to establish the boundaries and principles of sustainable management for their particular regions.

While Furuseth and Cocklin (1995:199) consider that it is too early to fully assess the success of the RMA approach, they have found that there is a high degree of consistency between the councils in the way that they interpret the concept of sustainable resource use at the regional level. They consider, however, that the definitions that do emerge lack specificity, give little direction in terms of appropriate theory, and offer no real potential for assessing sustainability in practical terms. Fitzgerald (pers. comm. 11/7/96) considers that one reason for this is perhaps that the ministry responsible for administering the RMA (the Ministry of the Environment) has not so far played a strong role in monitoring the quality of regional policies or building the capacity of regional councils to undertake regional planning. He also considers that conflicts have arisen within regional council activities because of urban representatives dominate in many regions.

There appears already to be a wide variation in the extent and quality of regional planning documentation being developed by regional councils (Morgan 1995:334). There also appears to be little structured negotiation towards the settlement of regional Maori claims via the regional planning process (Fitzgerald pers. comm. 11/7/96).

4.1.2 Canada

Federal institutional arrangements

Until the late 1970s, Federal initiatives in regional planning were focused exclusively on regional economic development projects and paid little direct attention to the environment. Indeed, the government at one time set up an Office of Regional and Economic Expansion with major programs for regional infrastructure development and industry restructure in key regions. While some of the schemes under the program were successful, many failed when Federal subsidies ended (Shrubsole, pers. comm. 27/6/96). Since then, because of funding cutbacks, regional planning has not been in vogue, and the Federal government has generally played a relatively weak role.

However, as in the United States and Australia, Federal institutional arrangements for forest planning have been the precursor to significant advances and activities in regional resource use planning. As a result of a number of documented crises in Canadian forest management and the international shift towards ESD, many sustainability concepts have been endorsed by the Canadian Government via the Canadian Council of Resource and Environment Ministers and by Canadian foresters in the 1987 National Forest Sector Strategy (Dunster 1992:68).

Despite this, Ontario is the only province that has attempted to undertake comprehensive environmental assessment of timber management. Furthermore, there is considerable criticism of the forest management focus of the statutory planning activities of the Ontario Ministry of Natural Resources (OMNR) and the inability of environmental assessment activities to meet ESD criteria (Dunster 1992:69). Forest management plans established by the OMNR tend to operate as *de facto* regional planning instruments in the northern, less populated parts of the province.

As a result of rapid urban and industrial expansion in ecologically sensitive areas, various regional planning activities of significance have evolved with strong Federal backing. One of these was established in 1988 through the Federal government's appointment of a Royal Commission to inquire into the future of the Toronto waterfront and to seek the concurrence of affected authorities to enhance physical, environmental and administrative approaches to the use and development of the waterfront and related lands (Crombie 1992:1). The Royal Commission worked from June 1988 to December 1991 in order to complete additional work requested by the Province of Ontario.

The commission organised five work groups to look at a broad range of issues, and planned a series of public hearings after preparing several discussion papers. In addition, commission staff and experts began to analyse a range of land use and development activities. The commission maintained an open process that encouraged stakeholder involvement, and the resulting draft recommendations in August 1989 received both Federal and Provincial support. Indeed, Ontario Province responded by extending the mandate of the commission to address additional issues on a broader, more integrated regional basis. The commission used methods similar to those employed during its first phase, and released a second interim report in 1990. Recommendations included the adoption of an ecosystem approach as a basis for integrated planning and programs; partnership agreements between the Province and municipalities; specific environmental and development projects; and revision of the *Planning Act* and other legislation (Crombie 1992:8).

Moves towards negotiated regional planning in British Columbia (BC)

Land use planning in BC has traditionally been driven by natural resource exploitation, particularly in forestry and mining (CORE 1993). Over the past 30 years there have been increasing calls for comprehensive approaches to land use planning and, in 1991, the government of the province was elected “with a strong mandate to significantly improve...environmental management”(Ministry of Forests 1996). Over 90% of BC is Crown land, but in the past two decades there have been marked increases in population, industrial expansion and resource use (Ministry of Forests 1996). The Commission on Resources and Environment (CORE) is an independent statutory commission that was established by the government in 1992 “to advise the government and people ...on land use and related resource issues” (CORE 1992). CORE’s legislative base requires the development of a BC-wide Provincial Land Use Study for “land use and related resource and environmental management” (CORE 1992).

CORE has powers of investigation and to call public hearings in commissions of inquiry, and must report to the public, legislature and executive (CORE 1992). The commission is an advisory (not decision-making) body with a major responsibility to enhance public participation in planning.

CORE’s planning strategy recognises provincial, regional and community levels. Through consultation, CORE developed principles and goals

for “environmentally, economically and socially sustainable land use...to guide the land use planning process throughout BC” (Ministry of Forests 1996). This was done through “multi-party, consensus-based negotiation” and consultation with stakeholders (CORE 1993). A provincial sub-regional planning activity, the Land and Resource Management Planning process, is currently under way.

The basic principles for the planning process rely on the concepts of environmental, economic and social sustainability (CORE 1993). The availability of “comprehensive data, through research and inventory preparation” is essential for planning, as is the need for “field monitoring and auditing systems...to ensure [consistency] with land use goals” (CORE 1993). To achieve a balanced and sustainable land use pattern across a region within the Land and Resource Management Planning, the region “must be sufficiently large to make possible the accommodation of the needs of all legitimate interests...through a negotiated and shared decision making process in which all interests are regarded as having equal status regardless of their authority or power” (CORE 1993). These processes have already been used in three regions and it is proposed that the activity will continue throughout the province (CORE 1993).

Public participation is optimised through structured and collaborative negotiation between stakeholders to determine recommendations for preferred land use patterns. The commission has tried to “make no prior assumptions about which interests will be represented at the negotiating table” (CORE 1993). To help ensure “full and effective representation” those stakeholders with demonstrated need are assisted with funds, services and facilities to support the presentation of their positions. To further ensure the success of the decision-making process all interested parties are “invited to participate in the design and evolution of the process as well as in negotiation of substantive issues” (CORE 1993). This shared approach to decision-making has been adopted in each of the regional land use negotiation activities undertaken to date. Long-time protagonists have apparently come to see negotiation as preferable to confrontation and have developed “in a climate of suspicion and deep rooted cynicism ...the regional infrastructure necessary to support a complex, multi party negotiation process” (CORE 1993).

4.1.3 The United States

Steiner (1983:307) considers that academic debate about economic fairness and ecological relationships in the US during the 1960s started to influence

legislation for new regional planning programs in the early 1970s. Such programs include the Appalachian Regional Planning Commission, New York's Adirondack Park Agency, the Tahoe Regional Planning Agency, and the New Jersey Pinelands Commission. Regional planning also occurs on the nation's public lands (up to 42% of land in the US), a significant example being the US Forest Service's system for land and natural resource management.

The Appalachian Regional Planning Commission focuses on the development of regional economic and social infrastructure, although it also delivers environment and natural resource programs. It was established under Federal legislation (*Public Works and Economic Development Act 1965*) designed to assist relatively cohesive but economically disadvantaged regions to become economic development regions. The Adirondack Park Agency, on the other hand, focuses on natural resource management across counties within one State, and was established in 1971 as a result of growing land use conflict in the region. The agency was directed by the State legislature to write a master plan for the state-owned land and to propose legislation for private land within the park. Local government plans and projects with regional impacts are reviewed and approved by the agency (Steiner 1983:308).

As a result of conflict arising from rapid urban and recreational development in the environmentally sensitive Lake Tahoe area in the 1960s, the Tahoe Regional Planning Agency was established cooperatively between Nevada and California. As the agency continued to be a focus for environmental versus development debates during the 1970s, President Carter signed into law the Tahoe Regional Planning Compact in 1980. This gave Federal recognition to the agency and the power to establish environmental thresholds and carrying capacities. Congress further directed that these thresholds be incorporated into the Lake Tahoe basin's regional plan and implementation ordinances (Steiner 1983:310). The regional plan for the New Jersey Pinelands arose somewhat differently. It derives from the designation by US Congress in 1978 of the Pinelands and the country's first national reserve. In 1979, New Jersey itself passed the *Pinelands Protection Act*, establishing the Pinelands Planning Commission responsible for coordinating the planning of the local, state and national governments.

As in many aspects of environmental planning in the United States, forest planning has again established important precedents and models for integrated regional resource use planning. The *National Forest*

Management Act and the *National Environmental Policy Act* stipulate the use of integrated, interdisciplinary teams for resource use planning for national forests. Garcia (1989: 583) reports that more than half of these teams meet legislated compositional requirements, and that, by and large, forest planners strongly support their use and consider that they lead to better integrated resource plans in the 122 National Forest and Grassland areas across the country.

4.2 Regional Resource Use Planning in the Australian National Context

Because Australia has a federal system of government, most land use planning and management responsibilities in Australia are carried out by the States, and to a lesser extent, are delegated to local governments (McDonald 1992:247). However, the fluctuating role of the Commonwealth in regional development and environmental affairs has meant that, in recent years, it has played a more direct role in promoting various regional approaches to land use planning. As noted in chapter 1, an economic development theme focuses on the voluntary facilitation of stronger regional economies. A second theme revolves around regional social development and the facilitation of indigenous interests in resource use. A third theme has relied on the twin aims of providing resource security for industry sectors, while seeking to meet international obligations on environmental protection. While these themes do not necessarily contravene State rights and objectives, some States have viewed Federal involvement as a move to undermine their power by building a *de facto* form of regional government.

4.2.1 Regional economic development

Regional Economic Development Organisations

As mentioned in chapter 1, the previous Labor government's Working Nation White Paper led to the establishment of a Regional Development Program (RDP) in 1994 within the Department of Health, Housing and Community Services (later restructured to become the Department of Transport and Regional Development). Labor originally intended to complement the RDP by the establishment of new case management arrangements and the Area Consultative Committees within the Department of Employment, Education and Training (DEET). This link was established to make employment and training programs more relevant to local needs and regional development strategies. Elements of the

Rural Adjustment Scheme were also to be tailored to meet the structural adjustment needs of specific regions (DHARD 1994:2). The program was strengthened in 1995 as a result of the Prime Minister's "Community and Nation" statement (Commonwealth of Australia 1995b:19).

The RDP comprised opportunities to establish regional planning structures, strategies and projects, regional strategic infrastructure and management and skills enhancement for regional organisations. It remained flexible in its definition of a region and regional economic development organisations (REDOs) eligible to be established under the program. The intention was that REDOs would focus on economic development, and include core groups of business, union, local government, education and training representatives. Depending on the particulars of regional activities, there would also be opportunities for the involvement of other interests such as environmental and community groups. In addition, REDOs were not to be sectorally dominated and were to have the ability to integrate various economic and social development interests (DHARD 1994:8).

The RDP hoped to establish new REDOs where no appropriate institutional structures existed. It also aimed to build the capacity and broaden the planning mandate of existing regional bodies (eg. Voluntary Regional Organisations of Councils [VROCs], State regional development boards or regional employment committees supported by the Office of Labour Market Adjustment, etc.). Funds of up to 75% of those required were to be made available for regional economic analysis and strategy development activities such as regional resource audits, vision and objective setting, consultation and negotiation with key stakeholders, and the development of three to five-year strategies focused on achievable results. Project and strategic regional infrastructure funding could arise from these strategies (DHARD 1994:14).

The RDP continued under the current Coalition government until 18 July 1996, when Federal support was terminated, to reduce the duplication of State regional development efforts and responsibilities (see Sharp 1996). A number of REDOs, however, will continue to seek to operate with alternative funding because of the commitment to regional economic development that has evolved since their establishment. Despite the demise of the RDP itself, many REDOs are likely to continue to have a role in regional planning processes throughout Australia.

Regional tourism planning

Regional tourism development has evolved as a sub-theme to regional economic development, but it has often not been linked directly to REDO-based activities. A number of specific institutional arrangements for regional tourism planning exist by virtue of both State policies supporting the development of regional tourism plans and the nature-based eco-tourism industry's linkages to the National Strategy for the Conservation of Australia's Biological Diversity. Many State-based policies have often resulted in narrow regional tourism strategies focused on market development and market capture. The National Ecotourism Strategy and the National Tourism Strategy, however, both recognise the need to use ecosystem/ bioregional approaches to managing, interpreting and promoting natural and cultural tourism resources in a sustainable manner (Department of Tourism 1994). Both of these strategies have implications for regional resource use planning in rangelands. While the National Tourism Strategy Supports the development of regional tourism plans, the National Ecotourism Strategy supports integrated regional planning based on ESD principles (Preece 1995:19).

Regional service delivery planning

Most Commonwealth departments plan their own regional level service delivery arrangements. Because the level of coordination between Commonwealth service deliverers was traditionally poor, the Federal government sought to improve regional service planning and coordination. It created the Commonwealth Programs Regional Impact Committee on which all departments were represented. In June 1995, the Committee announced that it would be trialing different program delivery models in several regions to find the most effective way of improving Commonwealth program delivery. It was intended that these pilots would explore ways to make Commonwealth program delivery more responsive to regional needs and to enable regions to optimise their growth and development through greater synergy with Commonwealth programs (DHARD 1995a:3).

4.2.2 Regional social development

Social development and human service delivery

As previously mentioned, the Whitlam government's AAP was instrumental in establishing funded, government-supported frameworks for regional social planning and development. According to Hayden (1996:186), welfare specialists in Victoria developed the concept through their close links with the Labor party and eventually had it endorsed as

Labor policy. Under the plan, Australia was to be broken into Regional Social Development Councils that were intended to be representative of the regional community. Each council would administer its own budget, provided by the Commonwealth, to operate a range of locally determined welfare programs.

Several pilot projects were established under the AAP, concentrated in south-eastern Australia. Most of them failed (see subsection 5.3.4), and since the collapse of the Whitlam government, the regional social development theme has not re-emerged in government policy (see Jones and Thornthwaite 1994). Perhaps as a result of the failure of the AAP system, both State and local governments were suspicious of the regionalist economic development agenda promoted by Minister Brian Howe under Labor in the early 1990s. Many felt it revived the perceived intention of the Whitlam administration to bypass 'recalcitrant' State and local governments.

While federally-sponsored approaches to regional social development collapsed in the 1970s, Federal, State, community and local government-backed attempts to establish structures and processes have waxed and waned across the nation. Jones and Thornthwaite (1994) review an extensive range of institutional arrangements in place for facilitating regional social infrastructure planning. These have included: (i) community and local government supported regional social development councils; (ii) regional social planning undertaken by VROCs; (iii) agency and local government based mechanisms for regional social planning and coordination; (iv) federally-funded family resource centres; (v) agency-based regional human services planning; and (vi) regional land use planning processes that have included social infrastructure components.

Since the early to mid 1990s, planning for regional human services delivery has re-emerged as an important factor in Commonwealth human service agencies (see Jones and Thornthwaite 1994). These plans largely focused on administrative planning for the delivery of Commonwealth-funded human services. They often have been based on the analysis of regional social data, but have rarely been underpinned by inter-agency cooperation and priorities identified from community-based planning. In some cases, the processes used have been replicated by equivalent State agencies (see Jones and Thornthwaite 1994).

Institutional support for regional planning by indigenous people

A second social development sub-theme of significance to regional resource use planning in

rangelands has emerged from various legal and policy developments in indigenous affairs. First was the establishment of 60 (now reduced to 35) ATSIC Regional Councils, and the election of zone representatives to ATSIC (see Sullivan 1996). Under the *Aboriginal and Torres Strait Islander Commission Act 1989*, regional councils must develop regional plans for "improving the economic, social and cultural status of Aboriginal and Torres Strait Islander residents of the region" (ATSIC 1994a). These plans should be integrated with other regional planning processes likely to affect indigenous interests (ATSIC 1994b).

More recently, the findings of the High Court in relation to *Mabo and others. vs. The Queensland government* have placed native title issues firmly on the resource use planning agenda. In response to the High Court decision, the Federal government passed the *Native Title Act 1993*. In negotiations leading to the Act, land councils across northern Australia played a critical role in ensuring that it would provide significant opportunities to negotiate regional agreements that would reconcile resource use and development in Aboriginal domains with the native title and social justice aspirations of Aboriginal traditional owners (see ATSIC 1994a). The concept is retained in the Government's response to the High Court's *Wik* decision. The concept of regional agreements has been strongly influenced by the Nananvuut regional settlements in north-western Canada (eg. see Richardson *et al.* 1994).

4.2.3 Environmental protection/resource security

This theme in regional planning underpins institutional arrangements which directly and indirectly support regional resource use planning. It has evolved from conflicting calls for resource security from industry and calls for the adoption of ESD principles from domestic and international sources.

National Strategy for ESD

As a direct result of the international ESD process, Australia established a range of ESD working groups to examine particular issues concerning its implementation across Australia. The working group approach culminated in the adoption of the National Strategy for Ecologically Sustainable Development (Commonwealth of Australia 1992a) by Commonwealth, State and local governments. The strategy guides policy and decision-making, particularly in those sectors that depend on the use of natural resources. The strategy encourages strategic and regionally focused research and cross

jurisdictional arrangements such as those established by the Cape York Land Use Strategy and the Murray–Darling Basin Commission (see Commonwealth of Australia 1992a:60). Similarly, the Commonwealth will report annually to the Commission on Sustainable Development on progress in a number of regionally relevant commitments set out within Agenda 21.

Intergovernmental Agreement on the Environment

On 1 May 1992, an Intergovernmental Agreement on the Environment (IGAE) was signed by the Commonwealth, six States, the Australia Capital Territory, the Northern Territory and the Australian Local Government Association (ALGA). The agreement was negotiated at a series of Special Premier's Conferences during 1991 and 1992 and represents an attempt by all levels of government to establish standardised programs and machinery for protecting environmental values, and for establishing national strategies to overcome some of the problems in this area (Rigney 1993:71). It also put in place intergovernmental machinery to help plan Australia's environmental future, including enforceable national environmental standards (Rigney 1993:71). The parties to this agreement pledge a high degree of mutual cooperation and consultation in planning for the Australian environment, while respecting the environmental planning processes of each participant.

While the IGAE does not specifically encourage or refer to regional planning, it does, in general, commit the parties to a range of broad ESD principles for environmental decision-making. These include application of the precautionary principle and consideration of intergenerational equity. It also pledges cooperation in nine functional areas, all set out as separate schedules annexed to the agreement. These include data collection and handling, resource assessment and land use decision making, environmental impact assessment, national environmental protection measures, biological diversity, world heritage and nature conservation (see Commonwealth of Australia 1992a:114).

Rigney (1993:72) discusses elements of schedule 4, covering the establishment of a Ministerial Council to be called the National Environmental Protection Authority, to be implemented through Federal legislation followed by complementary State legislation. It was intended that the Authority would have quite significant powers to establish measures for the "protection of the environment for the benefit of the people of Australia", including land, marine and air environments. Once the authority had identified these

measures, it was intended that their implementation would be legislated for by the Commonwealth and States. A Working Group on Environmental Policy was to prepare and submit draft legislation to implement the agreements contained in Schedule 4. Given the subsequent changes in the political composition of the Federal and many State governments, however, there is a risk that the agreement may lapse, as it is a political rather than a legal compact.

National Strategy for the Conservation of Australia's Biological Diversity and Ocean Rescue 2000

As a result of the Convention on Biological Diversity, a draft National Strategy for the Conservation of Australia's Biological Diversity was prepared by the Australian and New Zealand Environment and Conservation Council (ANZECC Taskforce on Biological Diversity 1993). This was done in consultation with a number of key industry, community and local government groups. The goal of the strategy is to protect biological diversity and to maintain ecological processes and systems. In particular, it recommended action on managing biological diversity on a regional basis, "using natural boundaries to emphasise regional environmental needs, promote community participation and to encourage intergovernmental cooperation". The draft strategy stressed that high priority should be given to promoting sympathetic management of diversity in areas adjoining protected zones, linking regional planning to local government activity, and increasing the involvement of those in the community with special knowledge and skills in management (DASETT 1992:18).

The final strategy considered that environmental characteristics are the principal determinant of regional planning boundaries (Commonwealth of Australia 1996). As a result, at the national level, work is under way to develop an Interim Biogeographic Regionalisation for Australia (IBRA). This does not integrate economic and social considerations. Nonetheless, Preece *et al.* (1995:21) consider it a key input to the development of a national framework. The Commonwealth is also charged with producing a Marine and Coastal Regionalisation of Australia by the year 2000 under the Ocean Rescue 2000 program (Preece *et al.* 1995:22). Ocean Rescue 2000 is a ten-year program to protect the marine environment, including a national marine conservation strategy, a state-of-the-marine-environment report and the development of a national system of protected marine areas (RAC 1992d:38).

Draft National Strategy for Rangelands Management

As concern about the ecological condition of rangelands and their socio-economic viability has been building for some time in Australia, a National Rangelands Management Working Group was established by the two Ministerial Councils with responsibility for rangelands management (ie. the Australian and New Zealand Environment and Conservation Council, and the Agriculture and Resource Management Council of Australia and New Zealand). In 1996, the working group established a draft National Strategy for Rangeland Management. The strategy included a broad vision for the sustainable management of rangelands, numerous broad goals and objectives and specific action strategies. These objectives and strategies directly and indirectly call for an integrated approach to rangelands management at the regional scale (ANZECC and ARMCANZ 1996).

Regional planning in world heritage areas

World Heritage areas established under the *World Heritage Properties Conservation Act 1983* provided the impetus for some of the most significant statutory regional resource use planning in Australia. Australia has 12 World Heritage areas which vary in terms of their cultural and natural values, and the way they are planned and managed. Lane *et al.* (forthcoming) detail the institutional basis for the nomination and acceptance of Australia's World Heritage areas, and assess the nature of planning and management against the principles of the World Heritage Convention. Of the 12 Australian areas discussed, 10 are regions in their own right. Approaches to planning and management of these areas are of regional significance. World Heritage areas of direct or indirect relevance to Australian rangelands include the Willandra Lakes (NSW), Uluru and Kakadu national parks (NT), Shark Bay (WA) and the Wet Tropics and Great Barrier Reef World Heritage areas (see Map 1).

As Lane *et al.* (forthcoming:6) point out, the administrative basis for planning and management of World Heritage areas is extremely variable, including: independent statutory authorities under complementary State and Federal legislation; existing State-based national park agencies; or temporary arrangements under existing State planning statutes. Also, some are managed under joint management regimes with Aboriginal communities, the boundaries of many have been set amid rancour; some incorporate a range of land tenure types, and there is considerable variability in the resources available for

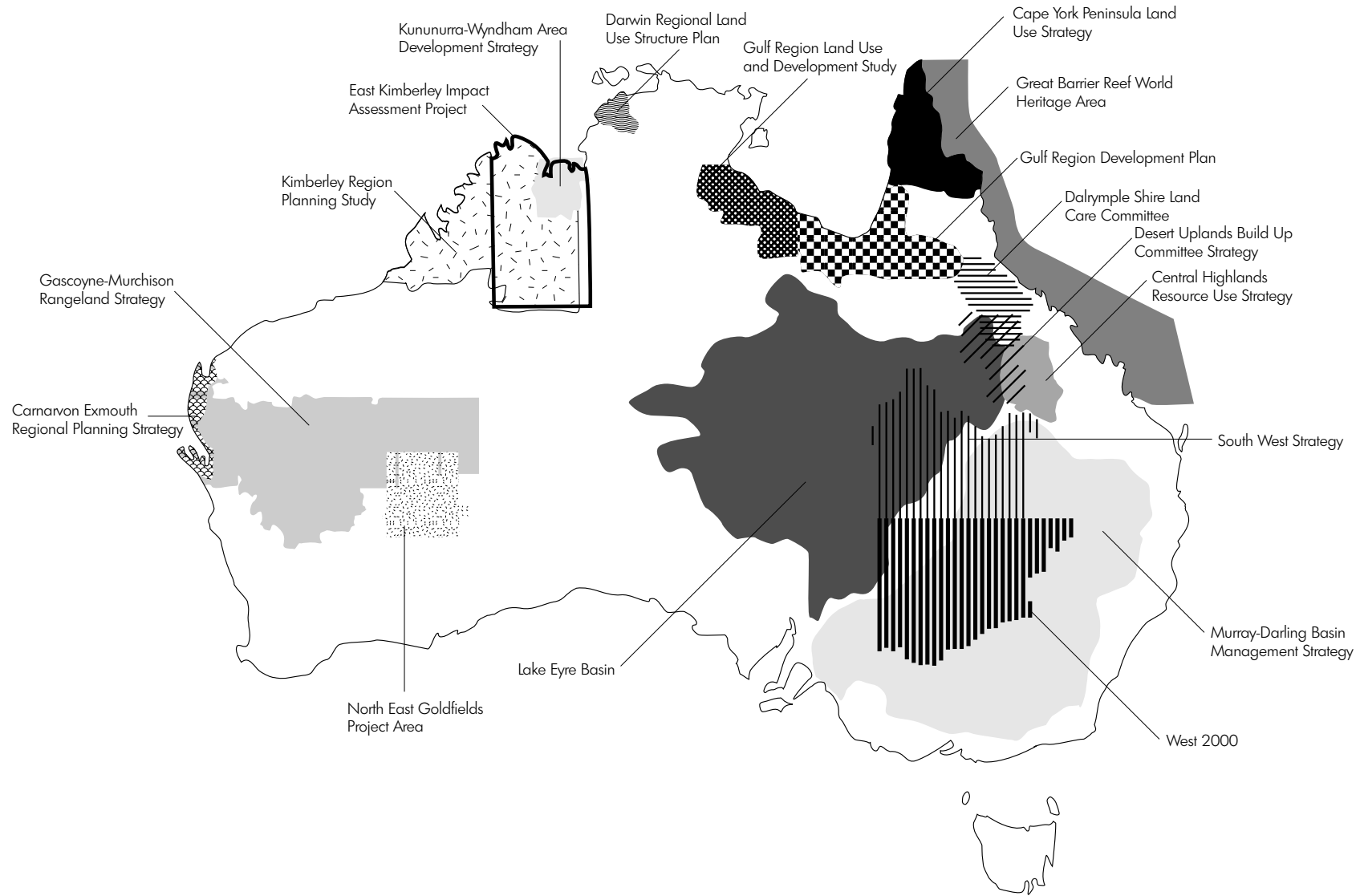
their management. Lane *et al.* (forthcoming:6-7) summarise the models of management used in World Heritage (Table 5).

National Forest Policy Statement

As a result of political debate in the early 1990s over the use of Australia's native forest resources, a range of high-level processes resulted in the development of a joint Commonwealth/State/Territory position on forest resource management. These processes included the Ecologically Sustainable Working Group on Forest Use, the National Plantations Advisory Committee and the Resource Assessment Commission's Forest and Timber Inquiry. Impetus for action also arose from the Commonwealth's National Conservation Strategy for Australia and the 1986 National Forest Policy for Australia developed by the Australian Forestry Council (see Commonwealth of Australia 1992b).

The National Forest Policy Statement was adopted by all States and Territories (except Tasmania) in 1992. It outlined agreed objectives and policies, and presented a vision for the sustainable use and management of Australia's forest resources. It aimed to establish a management regime focused on the ecologically sustainable development of a range of uses and values, including tourism, recreation and the production of wood and non-wood products. A primary goal within the statement was the need for integrated and coordinated decision-making and management to reduce fragmentation and duplication and to improve interaction among forest management agencies to achieve agreed and durable land use decisions (Commonwealth of Australia 1992b).

Apart from reaffirming Commonwealth, State, Territory and local government commitments to the fundamentals of the IGAE, the Commonwealth government agreed on the need for a single comprehensive regional assessment (CRA) process whereby the States could invite it to participate in the undertaking of planning for forested areas of a region (See Subsection 5.5.2). CRAs were intended to involve the collection and evaluation of information on environmental and heritage aspects of forests, and provide a basis for the Commonwealth and the States to reach an agreement relating to their obligations for forests in the region, including National Estate values, World Heritage values, Aboriginal heritage values, environmental impacts and obligations relating to international conventions (Commonwealth of Australia 1992b:24).



Map 1. Regional resource use planning in Australia's rangelands. Note that this map does not include planning undertaken by individual agencies for the distribution of NHT funds, or for Comprehensive Regional Assessments.

Table 5. Models of planning and management in World Heritage regions.

Management model	Characteristics of relevance to regional resource use planning
Direct Commonwealth Management Model Kakadu National Park Uluru National Park	Commonwealth centrally controls all planning and management activities under the National Parks and Wildlife Conservation Act 1975. Joint management arrangements (including majority Aboriginal management board) negotiated with traditional Aboriginal land owners. Planning receives input from Interest Groups Advisory Committees with community, conservation, user and scientific representatives. Planning results in final Plan of Management for the National Parks.
Joint Management Authority Model Wet Tropics Great Barrier Reef	Separate statutory authorities established comprising representatives of State and Commonwealth government via a Ministerial Council. Statutory plans established under the relevant Acts and requiring community participation. Broad Strategic Plans have been negotiated with core stakeholders which attempt to coordinate conservation and land management across three levels of government and across resource managers. Strategic plans must deal with multiple-use zoning arrangements and multiple land and resource managers. They establish permit and development assessment processes. Community and scientific consultative committees operate.
The Non-Legislative Administrative Agreement Model South West Tasmania Shark Bay	Based on a non-legislative administrative agreement between the Commonwealth and the State, establishing a Ministerial Council and a cooperative assistance program (Tasmanian Wilderness). Consultative committees assist management, but are advisory only. Strong attempt at coordinative management (Tasmania). Conservation agencies establish required management plans. Four-stage public consultation process (Tasmania).
The State Planning Model Lord Howe Island Willandra Lakes	State land use planning legislation provides the basis for management across a number of tenures and uses. Management involves the preparation of regional environmental plans under the NSW Environmental Planning and Assessment Act 1979 Statutory planning instruments recognise World Heritage values but use existing planning, enforcement and control arrangements. Socio-economic assessment commissioned by the Commonwealth and Community management committee/Scientific advisory committee formed after the initial failure of planning attempts at Willandra Lakes.
Source: modified from Lane <i>et al.</i> (forthcoming).	

In undertaking CRAs, a number of core requirements are spelt out in the National Forest Policy Statement. State agencies are to coordinate assessments. The resulting agreements are to cover guidelines for all aspects of management, including establishing a sustainable yield, the application and reporting of codes of practice, and the protection of rare and endangered species and National Estate values. The regional agreements will also accredit the CRA processes as a basis for evaluating forest resource use impacts (Commonwealth of Australia 1992b:25).

Since the launch of the statement, most States have released complementary policy statements confirming the agreements reached within it. As a result of ongoing negotiations between the Commonwealth and the States, there also have been considerable refinements in the proposed CRA processes. These approaches have shifted to differing degrees from technical assessment towards greater integration of social, economic, environmental and heritage considerations (see Commonwealth of Australia 1995a).

National Coastal Action Program

Chapter 1 noted how the RAC Coastal Zone Inquiry (RAC 1993b:363) recommended the formation of a National Coastal Action Program to implement its recommendations on integrated resource planning and management. The RAC commended the fact that many local governments are now involved in regional cooperation, noting that approximately 50 voluntary regional organisations covering 40% of all councils had been formed in the last decade. Some of these organisations had been formed to deal specifically with coastal issues. As a result, it considered that local and regional aspects of the National Coastal Action Program could be coordinated through these voluntary regional organisations of councils (RAC 1993b:135).

Other legislative powers, sectoral strategies and programs

Funding programs established under various pieces of Commonwealth financial assistance legislation (possible under section 96 of the Constitution) have been, or potentially can be, used to support regional planning activities in cooperation with the States. Opportunities for funding of regional resource use planning activities exist, for example, under the Rural Partnership Program and the new Natural Heritage Trust.

Opportunities also exist, however, for the Commonwealth to impose a wide range of conditions upon grants provided under legislation derived from its section 92 powers. Examples could include grants provided to the State under the *National Water Resources (Financial Assistance) Act 1978*, the *Environment (Financial Assistance) Act 1977*, and the *Soil Conservation (Financial Assistance) Act 1985* (see Rigney 1993:67). This last Act provided the basis for the National Soil Conservation Program Fund to fund projects throughout Australia. These Acts provide scope for direct Commonwealth support for integrated regional resource use planning (Alexandra 1996b).

Finally, there are a number of R&D organisations that currently are supporting regional resource use planning activities in various parts of Australia, including rangeland environments. Under its Rangelands Program, for example, LWRRDC is currently funding three R&D experiments in regional resource use planning in Queensland, NSW and Western Australia (see details in section 4.3). Additionally, the Cooperative Research Centre (CRC) for Tropical Savannas is currently developing a number of regional land sustainability case studies in Queensland, Western Australia and the Northern

Territory. The CRC projects will undertake case studies with regional stakeholders to help them determine where present land uses are not sustainable and how land use might be changed to ensure sustainability. It is envisaged that this will involve stakeholders determining value systems in the region and developing production functions relating these values to intensity of use. Unsustainable land uses will be identified, and opportunities to reallocate existing land uses will be negotiated with the help of appropriate information technology (Hynes *et al.* 1996:12–13).

4.3 Regional Resource Use Planning at the State Level

This section briefly reviews current State institutional arrangements for regional resource use planning. It builds a clearer picture of regional resource use planning practice in Australia and provides insights for the future application of such approaches in rangelands. In addition, it illustrates that the vast majority of such planning activities carried out in Australia are driven by State rather than national imperatives. Those regional resource use planning activities that have been carried out within and adjacent to Australian rangelands (see Map 1) are accorded particular attention. Summary tables of the regional planning activities for those States with significant rangeland areas are given in Appendix 1.

4.3.1 Queensland

Since the early 1990s, regional planning has become more prominent in Queensland. A significant factor influencing this was controversy over competing resource uses (particularly timber, mineral sands, tourism and conservation) on Fraser Island. A Commission of Inquiry into the Conservation, Management and Future Use of Fraser Island and the Great Sandy Region handed down its recommendations in 1991 (see CIMUFIGSR 1991). They led to World Heritage listing of the area in 1992, and the subsequent development of the Great Sandy Region Management Plan in 1994 (see Fraser Island Implementation Unit 1994).

Many of the recommendations of the Fraser Island inquiry dealt with broader aspects of the State's land use planning system, and they strongly supported the State government taking a much more direct role in facilitating regional approaches to planning (see subsection 1.2.3).

As a direct result, but without legislative change, there have been moves towards State-sponsored

planning processes which establish Regional Frameworks for Growth Management (RFGMs). The SEQ 2001, FNQ 2010, WHAM 2015, Wide Bay 2020 and CQ New Millennium processes have concentrated on managing growth in regions where population is rising rapidly (McDonald 1993:40). These projects are sponsored the Queensland Department of Local Government and Planning. McDonald (1993:40) suggests that these processes have produced “considerable” community benefits due to the high degree of public participation in them. Significant administrative difficulties remain, however, particularly in the relationship between State and local government.

A Department of Local Government and Planning-sponsored regional planning exercise in the Gulf of Carpentaria has also commenced. Following significant conflict between mining development and Aboriginal communities in Queensland’s north west, however, the State government has also announced that it will support a regional social impact assessment and multiple use strategic plan (marine) process in the Gulf. Aboriginal groups hope that these activities may establish a basis for an agreement to resolve land and natural resource use management issues in the region (Johnson *et al.* 1998)

To give legislative backing to the Department of Local Government and Planning led processes, the new *Integrated Planning Act 1997* now provides for statutory regional planning. The intention of the legislation is to make such regional planning highly participatory, and to involve State, local government, industry and community sector representatives in Regional Planning Advisory Groups (RPAGs) established to run the processes.

Various other VROCs are also taking steps to establish their own regional planning processes, in some cases without the significant resource provided by the State. The Eastern Downs ROC and the Central Western Queensland ROC are examples. To date, such activities have had to rely on *ad hoc* funding for particular projects, and have focused on the local government sector and economic issues.

A regional planning approach of great relevance to rangeland management evolved in south-western Queensland during 1993 in response to significant economic hardship being faced by landholders in the Mulga lands. The South West Strategy was sponsored by the Department of Primary Industries, and other State and Commonwealth departments. It established an integrated strategy that resulted in substantial funding being allocated and “reassigned” to the region to meet the economic, social and

environmental demands of essential property amalgamations in the region.

As the *Integrated Planning Act 1997* focuses its attention on urban aspects of the land use planning system, it is hoped that the proposed *Natural Resources Management Bill*, to be introduced into Parliament in the future, will further strengthen the statutory basis for regional resource use planning activities such as those undertaken in the south-west. In particular, the Bill, if enacted, may facilitate improved regional policy development and provide a statutory base for natural resource management plans and agreements, some of which may have a regional basis (see QDPI 1994).

Because of the national significance of Cape York Peninsula, the Cape York Peninsula Land Use Strategy (CYPLUS) evolved in the early 1990s as a joint Commonwealth–State regional land use planning activity. CYPLUS is described in detail in subsection 5.4.1, where it is noted that the failure of CYPLUS to fully accept the value of empowering key regional stakeholders resulted in those stakeholders coming together to negotiate their own form of regional agreement (see Cape York Land Council 1996).

As a basis for bioregional planning in Queensland, the Department of Environment and Heritage has divided the State into 13 bioregions (see Lambert *et al.* 1996). The Queensland Government is also establishing clearer institutional arrangements for dealing with tree-clearing regulation on leasehold land. These arrangements have obvious implications for regional resource use planning in rangelands. Some 38 local working groups have been established across the State to develop local guidelines with strong community input. These guidelines were open for public comment, reviewed and endorsed by the regional directors and CEOs of departments with an interest in natural resource management (see Queensland Government 1995).

State agency regional managers forums have evolved in Queensland as another institutional basis for regional approaches to coordination, and they have tended to strongly support regional planning approaches. Forum structures, for example, have been directly linked to activities such as CYPLUS, Eastern Downs Regional Organisation of Councils and other regional planning processes. Where no regional planning activities exist, the forums often provide the only framework for integrated and coordinated State decisions at the regional level. It is hoped that forum activities will increasingly be linked to VROC and local government activity in the future. A 1994

review of the nature and role of regional managers forums concluded that they should to be supported to achieve regional coordination and cooperation (see Queensland Office of Rural Communities 1994).

Consistent with the former Federal Labor government's RDP, the Queensland Government itself established a Regional Economic Development sub-program (QDBIRD 1994). The aim of the program was to assist regions (particularly through REDOs) to maximise business and industry development. The program worked on the basis that Queensland is made up of a cluster of integrated regional economies. It provided funds to communities to implement regional economic development strategies and regional coordination of government economic activity. The Queensland Department of State Development continues to implement aspects of this sub-program.

Quite separate from this sub-program, there have been a number of attempts at regional level planning for infrastructure development. These have often been undertaken on a joint government/ industry basis, have been non-participatory and are frequently based on a presumed vision of maximised economic and resource development. They have largely focused on the development of synergies between and infrastructure coordination for major resource developments in the region in question (see Cowell's [1996:60] analysis of the Carpentaria – Mt Isa Minerals Province Study).

Landcare groups and integrated catchment management activities are also supported to take (*ad hoc*) regional approaches to planning through the Queensland Department of Natural Resources and other State and Commonwealth programs. The Queensland Department of Natural Resources, for example, provides funding for regional facilitators to assist group development and planning (Queensland Department of Primary Industries 1993a:134).

Jones and Thornthwaite (1994:18–35) detail a number of “experiments” in regional social infrastructure planning in Queensland. They find that these were built on a variety of institutional bases. Those approaches that have focused on regional social infrastructure planning have included the Human Services Integration Project in the Caboolture region, the Mackay Regional Council for Social Development and the Central Highlands Rationalisation Exercise. Both the Human Services Integration and the Central Highlands projects were local-government-driven attempts to coordinate and rationalise human service delivery across three levels of government and community-sector human service

delivery agencies. The Mackay Regional Council was a community and local-government-driven attempt to revisit the AAP's Regional Council for Social Development concept. It was funded by a number of agencies as a pilot in regional social development.

4.3.2 South Australia

Significant land use conflicts in the rural–urban fringe contributed to the establishment of a number regional planning initiatives under the State Labor government in the early 1990s. The Barossa Valley Review was that first of these, arising from widespread public concern about urban encroachment on the wine-producing, heritage and cultural values of the region. The initiative for and organisation of the process came primarily from five neighbouring local government authorities. The review prompted a genuine attempt to design development control mechanisms to meet the specific needs of rural land use systems in the region (Houston, cited in McDonald 1992:257).

Houston (cited in McDonald 1992:258) contrasts the Barossa Review with the State-sponsored Mt Lofty Ranges Review, which again sought to resolve land use conflict arising from urban expansion into an area of high viticultural and conservation significance. The region was also part of the greater Adelaide catchment. Although the review commenced in 1986, Houston considers that political debate over the likely adverse reaction of particular sectors of the community to any curtailment of perceived development rights delayed the process and limited the possible outcomes.

In relation to water resource planning, the State government has recently begun a wide variety of water reform initiatives with regional planning implications, ranging from Murray–Darling 2001 to privatising the water and wastewater infrastructure (Scanlon 1996:5). A State Water Plan detailed in two documents, *Providing for the Future* and *Sustainable Management*, sets out strategic directions for surface and groundwater management (Scanlon 1996:6). In terms of regional environmental planning, the South Australian National Parks and Wildlife Service has prepared plans of management for regional protected areas and multiple use regional reserves (eg. the Innamincka Regional Reserve) under the *National Parks and Wildlife Act 1972*.

To support technical aspects of these sorts of activities in South Australia, the Department of Housing and Urban Development recently established an Information and Data Analysis Branch. The branch seeks to apply best-practice digital and

spatial technology to planning, and acts as a service provider to other agencies involved in regional planning (eg. the Department of Environment and Natural Resources, the Economic Development Authority and local government).

As in other States, South Australia also has a range of programs and processes that indirectly support regional planning. These include economic planning programs (eg. supporting regional development boards), catchment management programs (supporting catchment management groups), and coastal management planning activities (sometimes resulting in coastal management plans). The State's ongoing biological survey provides a sound basis for bioregional planning (Lambert *et al.* 1996:27). A Health and Social Welfare Councils Program (for independent community organisations) was also established on a pilot basis in 1988 to undertake regionally-based human services planning and promotion. The success of the program led to its extension in 1991 (Jones and Thornthwaite 1994:93).

4.3.3 Western Australia

The history of land use planning in Western Australia (WA) is rich in regional approaches, although it has been only in the last decade that emphasis has shifted from a traditional focus on economic and infrastructure development. Western Australian regional planning evolved from the Perth region under the *Metropolitan Town Planning Commission Act 1927*. The subsequent *Metropolitan Region Town Planning Scheme Act 1959* established a planning authority with regional planning powers (MacRae and Brown 1992:205). MacRae and Brown (1992:205) consider that outside Perth, however, "regional land use planning had a less explicit legislative basis", even though there have been significant reviews (including 1951, 1977 and 1984) of the planning system which have supported the need for regional approaches. While the government's strong commitment to decentralisation has resulted in many studies and strategies with broad economic development objectives, only a few of these have resulted in the development of some form of regional plan or framework (MacRae and Brown 1992:206).

Despite significant environmental and land degradation problems in WA in the mid to late 1980s, the State's Department of Agriculture or Department of Conservation and Land Management (CALM) sponsored few activities in integrated catchment management and regional resource use planning. Over the same period, the Department of Planning and Urban Development and its predecessor had produced a number of regional plans which included

measures for both conservation and development. However, at that time that department's activities were restricted to privately owned land, while CALM was responsible for Crown land (McDonald 1992:261).

MacRae and Brown (1992:210) consider that the philosophy of regional planning in WA shifted at that time, as the new Labor government's policy placed "a new emphasis on the need for State-wide urban and regional planning strategies based on a community approach to achieving local and regional objectives". In practice, however, regional economic development was an important thrust in government thinking, and regional planning activity was "seen as the precursor and symbol of Government involvement in this process" (Hedgcock and Yiftachel 1992:9). While this improved the status of this "previously neglected" component of planning activity, the focus was "tightly circumscribed by the development agenda". In the view of Hedgcock and Yiftachel (1992:9), regional planning and regional development became difficult to separate.

The policy resulted in the passing of the *State Planning Commission Act 1985* which, for the first time, provided a statutory basis for regional planning in country areas (MacRae and Brown 1992:2013). It also resulted in, and continues to drive, a series of regional plans sponsored by the State. As a result of greater public interest in environmental issues, for the first time in WA's history, these plans began, in the mid to late 1980s, to include environmental considerations. Indeed, some were instigated for environmental reasons (MacRae and Brown 1992:213).

Despite these improvements, responsibilities for environmental protection, natural resource management and land use planning remained dispersed across a number of disparate agencies. As a result of some of the problems this created, McDonald (1992:261) reports that geographer Bruce Mitchell was brought to Western Australia in early 1991 to help find a means of improving inter-agency coordination and integration within resource use planning. McDonald (1992:261) suggests that this later contributed to the findings of an inquiry into land degradation by a Select Committee of the Western Australian Parliament in the early 1990s.

Recent amendments to planning legislation (*Planning Legislation Amendment Act [No. 2] 1994*) have since provided statutory regional planning schemes in non-metropolitan areas to be prepared "where it is in the State's interest to do so" (WAPC 1995:34). Regional boundaries are flexible, and include REDOs, VROCs

and regional development commission boundaries as well as political, statistical, service delivery and catchment boundaries.

A separate process that has had a specifically regional impact on planning in WA was the Kimberley Pastoral Industry Inquiry, sponsored by the Department of Regional Development in 1985 (see MacRae and Brown 1992:214). The inquiry identified a need for regional land use planning to deal with conflict between pastoralism, tourism, Aboriginal interests and conservation in that region. This resulted in a joint planning exercise by the Department of Regional Development and the WA Department of Planning and Urban Development (1990a; 1990b).

The East Kimberley Impact Assessment Project was a unique regional planning activity that followed the Pastoral Industry Inquiry. It evolved because of increasing resource development pressures in an Aboriginal domain, declines in non-Aboriginal pastoralism and increases in Aboriginal land ownership. The project was a joint activity of the Centre for Resource and Environmental Studies at the Australian National University, the Australian Institute of Aboriginal Studies, the Anthropology Department of the University of Western Australia and the Australian Academy of Social Sciences. The project entailed a long-term demographic and ethnographic study of the Aboriginal population of the East Kimberley, and aimed to develop an methodological approach appropriate to social impact assessment within a multidisciplinary framework. It was conducted largely in association with Aboriginal communities in the region, and the intention was to “establish a framework to allow the dissemination of research results to Aboriginal communities so as to enable them to develop their own strategies for dealing with social impact issues”. It resulted in a range of multidisciplinary research studies, that would, it was hoped, empower Aboriginal communities in the region to negotiate better outcomes over a range of regionally significant issues (Williams and Kirkby 1989).

The Department of Conservation and Land Management (CALM) is currently responsible for routinely preparing regional management plans on behalf of the Land and Forest Commission and the National Parks and Nature Conservation Authority. The latter two bodies must submit their draft plans to the Minister for Conservation and Land Management for final approval. The first round of regional plans covering each of CALM’s 11 administrative regions was prepared during the late 1980s. These plans incorporated land and water in administrative regions

controlled by the *Conservation and Land Management Act 1984* (the Kimberley, Pilbara, Gascoyne, Goldfields, Greenough, Wheatbelt, South Coast, Southern Forest, Central Forest, Northern Forest and Metropolitan regions), and wildlife responsibilities under the *Wildlife Conservation Act*.

MacRae and Brown (1992:214) also consider that the State Conservation Strategy adopted in 1987 was reinforced by the adoption of integrated catchment management, and that this resulted in the development of regional rural strategies (eg. the Albury Region Rural Strategy in 1991) as forerunners of comprehensive regional plans. The Office of Catchment Management, formed subsequently, was given a brief to coordinate government activity in catchments throughout the State, and has since established a catchment management approach in a number of watersheds (see Synnott 1992:258). Synnott (1992:258) points out that this approach includes both riverine and groundwater catchments.

Since early 1995 there has been a high degree of collaboration between government departments and the community sector within the South Coast region in moves towards sustainable regional development. The aim of these activities is to develop a better understanding of sustainable management of the region. They were initiated by the Department of Agriculture, and began with a period of consultation to measure community Landcare and environmental concerns. This involved substantial input from government agencies such as CALM, the Water and Rivers Commission, the Department of Environmental Protection, local shires and the Great Southern Development Commission. This process resulted in a series of six “Land and Water Care Strategies”. As part of the initiative a series of projects has been developed to address the major issues identified. These include strategic planning, catchment planning, property management planning and assistance for completing critical projects (see AGRIA 1996:3).

Finally, as has been proposed in Queensland, various bodies (including LWRDC, the Arid Lands Coalition, rangelands industries, State agencies and the Goldfields–Esperance Development Commission) have joined forces to establish a project to explore effective planning procedures for ecologically sustainable development in two rangelands regions in WA. WA Agriculture leads the project, and has appointed a project leader and project management team. A Consultative Research Team is responsible for technical direction of the project. A Board of Management made up of the chief

executives of cooperating agencies and the chairperson of the relevant REDO oversees the project. The project aims to contribute to regional land use planning by involving the wider community, identifying possible land use allocations which meet ESD objectives, determining the ecological, social and economic benefits of proposed land use changes and encouraging implementation (ECRDO 1996:3).

Other programs and processes that indirectly support regional planning include economic planning programs implemented through regional development commissions (Woodhill and Dore 1997) and catchment management programs. In addition, a memorandum of understanding recently signed by the State and Federal governments and the WA Municipal Association will see new injections of funding into regional coastal planning activities in the near future.

4.3.4 The Northern Territory

While land use planning mostly is administered by local government in the States, in the NT, all non-metropolitan strategic planning is carried out by the NT Department of Lands and Housing (NTDLH). This has included the preparation of long-term regional plans such as the Darwin Regional Land Use Structure Plan (NTDLH 1990a), the Litchfield Land Use Structure Plan (NTDLH 1990b) and the Gulf Region Land Use and Development Study (NTDLH 1991). The department is usually responsible for the development of regional plans, even though, under the *NT Planning Act 1979*, the NT Planning Authority is authorised to do so at the direction of the Minister. The department does this under section 66A of the Act which gives the Minister the right to “publish the planning and development objectives of the Territory” (Dawson 1992:270). Dawson (1979) considers there are few avenues for public participation under this Act.

The Gulf Region Land Use and Development Study was based partly on the Holmes Report (The Pastoral Lands of the NT Gulf District Resource Appraisal), which focused on the economic viability of pastoral leases in the region (Holmes 1986). Holmes (1986) assessed land marginality against a program of land classification, evaluation of pastoral capabilities and the determination of costs and returns under various pastoral regimes. He used this information to assess the economic viability of properties under various assumptions, including criteria for viability, quality of management and degree of dependence on a controlled herd. Holmes (1990) seeks to apply these factors in determining alternative land use scenarios in marginal rangeland environments.

As in the States, there are a range of other planning processes and programs that impinge on regional planning. These include World Heritage Area Planning (Kakadu and Uluru), Regional Economic Development Committee-driven processes, catchment management processes and regional groundwater, protected area, and coastal management planning.

4.3.5 New South Wales

In 1995, the NSW Department of Urban Affairs and Planning recently released a Statement on Regional Development (NSWUAP 1995:3). The department has said that it is “seeking to facilitate collaborative approaches to guiding regional growth [which] involves working closely with councils and other key stakeholders to develop a strategic focus” (NSWDP 1995:2). This statement evolved as NSW’s population has increasingly regionalised in the last two decades. During that time various planning policies have been used to negotiate regional changes. The primary tools used have been regional environmental plans and regional (land use) strategies. Regional environmental plans establish statutory principles for land use and formal controls, whereas regional strategies are less formal and are used for cooperative approaches (NSWDP 1995:15).

The NSWUAP (1995:19) states that in conjunction with regional environmental plans and regional strategies, it promotes “coordination and consultation between key decision-makers”. Common participatory mechanisms include joint planning initiatives, consultative committees and inter/intra-governmental committees. Under the *NSW Environmental Planning and Assessment Act 1979*, the department has initiated a number of State environmental planning policies to guide regional resource management (NSWDP 1995:21). State environmental planning policies and regional environmental plans operate in addition to local environment plans and show how national, State and regional planning might be integrated (McDonald 1993:39).

Bioregional planning in NSW is supported by the NSW Environment Protection Authority, which provides guidelines for state-of-the-environment reporting by local government (Lambert *et al.* 1996:26). The Natural Resources Audit Council’s North East NSW study also provides a forerunner to bioregional approaches in that part of the State. The study has now become part of the Resources and Conservation Assessment Committee program, and will provide the types of information on which future

bioregional planning can be based Lambert *et al.* 1996:26).

As in other States, funding for National Heritage Trust-inspired regional strategies (and associated action plans) has been passed through total catchment management committees; mostly community-based organisations with paid facilitators and cross-sectoral representation on their committees. Arrangements for catchment management have recently been reviewed by the State, and a range of reforms is likely to be announced in the near future (Nick Abel, pers. comm. 11/3/97).

There are various other planning processes and programs of relevance to regional planning in NSW. These include World Heritage area planning, REDO and VROC-driven activities, catchment management processes, and protected area and coastal management planning. The Department of Land and Water Conservation is sponsoring two stakeholder-driven regional planning processes. NSW also has a Department of State and Regional Development with programmatic responsibility for promoting regional economic growth, usually through regional development boards (Woodhill and Dore 1997). The Premier's Department is currently piloting a regional coordination project. The functions of the NSW Roads and Traffic Authority and the Western Lands Commission also significantly affect regional land use. Finally, the State's Area Assistance Scheme supports regional approaches to address inequality in human services (Jones and Thornthwaite 1994:84).

As in Queensland and Western Australia, LWRDRC has recently funded, through CSIRO's Division of Wildlife Ecology (in association with the NSW Western Division of Land and Water Conservation), implementation of a project that will develop a knowledge system to support regional land use planning, development and conservation initiatives. This project will build upon "search conferencing" on equitable and sustainable resource use previously facilitated by NSW CALM (see NSWCALM 1993). The project aims to determine factors that influence land use patterns, developing tools and methods suited to information: dissemination, planning and implementation; integrating the knowledge system with existing decision and policymaking processes; estimating the financial, economic and environmental benefits and costs of current and potential future land uses; comparing benefits and costs of land use scenarios from the perspectives of stakeholders; estimating trends and seeking solutions to conflicts; and influencing knowledge and institution building in relation to sustainable land use (Nick Abel, pers. comm. 11/3/97).

4.3.6 Victoria

In August 1993 the Victorian Minister for Planning released a statement on "Planning a Better Future for Victorians:—New Directions for Development and Economic Growth". In it, he contends that "a new planning framework will establish the context for major government commitments and investments at the local, regional and State levels". This framework was intended to "give all Victorians, particularly the business community, a clear picture of how the State will develop" (Henshall Hansen and Associates 1994). It was to be focused on economic development and included a Capital City Policy, a new Melbourne Metropolitan Strategy, and a Development Framework for Victoria. The Department of Planning and Development initiated the process developing this statement by commissioning a range of issues-based consultancies and releasing them for public comment.

Core recommendations from one of the first of these consultancies included the establishment of regional development agencies (councils or other regional bodies) to play a role in proposing projects that required State and Commonwealth funding. The Victorian development framework would then be used to set priorities for implementation of projects and to allocate resources. Secondly, Henshall Hansen and Associates (1994:iv) suggested that strategic planning was needed at the State and regional level to encourage the development of regional strategies with an emphasis on actions for economic development.

Before the Ministerial statement, regional planning was already expanding. In October 1993, the Minister for Regional Development announced a development program to promote business and investment in regional Victoria. Strategies integrating economic development, sustainable resource management, rural adjustment and micro-economic reform were also being developed.

Once an issues paper was released in September 1994, a series of regional consultations was held with six (business, government agencies, local government and tertiary-sector dominated) regional consultation groups appointed by the Minister for Planning. These groups formally reported back in March 1995, their comments being used to establish the final development framework, and providing the basis for the development of regional strategies. While the groups were broadly supportive of the development framework, they placed a strong emphasis on the need for partnership and sustainable approaches to regional development. They also

preferred the use of flexible regional structures or networks and improved intergovernmental coordination rather than the establishment of a new tier of government (Regional Consultation Groups 1995:17).

In its draft form in late 1995, the State planning framework envisaged a comprehensive overhaul of institutional arrangements for regional planning in Victoria. Key features proposed included:

- integrated strategic planning and development at the regional level, focusing on natural resource management of catchments, regional economic and infrastructure development, quality-of-life issues and sustainable environmental and economic use of natural resources;
- a new *Catchment and Land Protection Act* to establish a framework for integrated management and protection of regional catchments, establishing a Catchment and Land Protection Council and encouraging the preparation of regional catchment strategies by regional catchment and land protection boards. These strategies would be gazetted, and public authorities would have to take heed of them. The boards would also have the power to recommend amendments to planning schemes to give effect to their strategies;
- a new *Coastal Management Act* to make provision for a Victorian Coastal and Bay Management Council and regional coastal boards. These boards would produce regional coastal management strategies;
- linking land use planning and resource management functions between the statutory planning system under the *Planning and Environment Act*, the *Catchment and Land Protection Act* and the *Coastal Management Act*, particularly through new regional groupings based on these structures, REDOs and other social and economic structures and the development of regional strategies (Victorian Department of Planning and Development 1995:A2–6).

Already, there have been positive reports of some of these existing and proposed reforms in the academic literature. Landcare, for example, began in Victoria in 1986, and is now widely embraced throughout the rural community and State government, and is considered by the State as the “major focus for achieving sustainable land management” (Curtis *et al.* 1995:415–6). Curtis *et al.* (1995:415), consider that, before 1992, landcare groups had not participated significantly in the development of policy and plans.

However, in late 1992–early 1993, community and government representatives participated in the Regional Landcare Action Plan process, contributing to the development of nine regional landcare plans. These plans formed the basis of Victoria’s response to the Commonwealth Landcare initiative and strongly influenced the aforementioned reform processes (Curtis *et al.* 1995:416). Development of the Regional Landcare Action Plan was an important attempt to incorporate community participation in resource planning in Victoria at a regional level.

While the State planning framework has not yet been completed, various regional strategies have been or are being developed in the Ballarat, Bendigo and Greater Geelong regions. The Department of Agriculture also convenes an interdepartmental committee overseeing sustainable development of rural areas, and worked with the Commonwealth government on two demonstration projects in Sunraysia and the Goulburn Valley originally funded under the national RDP. Reform has also been undertaken in local government administration and water supply (Victorian Department of Planning and Development 1994:4–5). A rural partnership program is in place to encourage regional approaches to rural development in the context of economic restructure of rural activity (Department of Planning and Development 1995:A2–6). The Department of Business and Employment (Business Victoria) also supports many community-driven regional organisations (Woodhill and Dore 1997).

In relation to public land, the Victoria Department of Planning and Development and the Department of Natural Resources and Conservation originally divided the State into 16 regions for planning and management (Lambert *et al.* 1996:41). The Land Conservation Council established under the *Land Conservation Act 1980* held responsibility for making recommendations to the Minister for Planning and Development for the strategic use of these lands. Lambert *et al.* (1996:41) outline the Mallee Region Review as an example of regional resource use planning under these arrangements.

Victoria also has a long tradition in regional social planning. As far back as 1977, regional consultative councils were established to drive delivery of the State’s Family and Community Services Program. These councils brought together a range of individuals and agencies to provide advice to the Minister on regional needs, to assist regional social planning and to develop cooperative approaches to human service delivery (see Jones and Thornthwaite 1994:93). Regional approaches to human service

planning have continued under various arrangements since then.

4.3.7 Tasmania

Tasmania does not have a strong history of support for integrated resource planning and management. The 1989 election of a minority Labor government with support from the Green parties raised hopes for a change in environmental management and planning, though this partnership later dissolved. Since then, however, there has been substantial revision of legislation addressing land conservation, coastal management, environmental protection and land use planning (see Graham 1992:262). The resulting resource management and planning system in Tasmania has been introduced over the past five years with a number of Acts espousing sustainable development objectives. The system is intended to provide an integrated policy, statutory and administrative framework for sustainable development, and it pursues a “whole of government, industry and community” approach to the use, development, conservation and protection of land and water (see Budge and Associates 1996).

The system promotes strategic planning at the State, regional and local levels, but it does not have strong statutory regional planning instruments. In a recent review undertaken to determine the appropriate instruments required to operate the new system, Budge and Associates (1996) found that there is, with one exception, no regional strategic planning, no regional government structure and no explicit statutory support for either. The exception is the Urban Management Program Group’s September 1995 endorsement of the need for a regional strategy for Hobart. The group was established around 1992 under the Commonwealth/State Better Cities Agreement, and is currently being facilitated by the State Planning Division in cooperation with other State agencies and local government (Tasmanian Planning Division 1996).

In relation to regional planning of public lands, the State government established the Public Land Use Commission “as an independent body with the task of inquiring into and making recommendations on the use of public land” (Lambert *et al.* 1996:27). Lambert *et al.* (1996:27) consider that the model is based on the Victoria Land Conservation Council, and that it will develop a set of reserve land classifications designed to ensure a comprehensive, adequate and representative reserve system.

There is no formalised framework for supporting regional economic development in Tasmania, but

Woodhill and Dore (1997) identify a series of specifically funded initiatives that are provided to a diversity of regional and local bodies such as development boards and local government enterprise centres.

4.4 Regional Resource Use Planning in Local Government

As mentioned in chapter 1, there has been increasing recognition of the need for integrated approaches to regional resource planning in local government. This interest has been institutionalised as a result of a major project being undertaken by the Australian Local Government Association (ALGA). The project is piloting the establishment of a process for developing nine pilot regional environmental strategies (RES) to be administered by VROCs (see Thorman 1995a).

ALGA has already prepared guidelines for the development of RESs. These have been developed as part of a project funded by the former Department of Housing and Regional Development (DHARD) to provide a direct link with the Regional Environmental Employment Program (REEP), a component of the “New Work” labour market program (Thorman 1995a). They were also intended, however, to develop comprehensive regional environmental strategies that are not linked only to job creation (see Thorman 1995b). Additional funding is now being provided by Environment Australia’s State of the Environment Unit for the development of environmental indicators that are directly relevant to management on the ground. As much as possible, the strategies are linked to other projects such as the DPIE Farm Forestry Program (ALGA 1996)

RESs set out a vision for the future of a region and provide a clear set of objectives and key actions to achieve this. They are intended to serve as a guide to all managers and interested parties in determining appropriate action, and should provide a basis for improved coordination. RESs are intended to operate on a long-term, values-based, cooperative approach. Ongoing evaluation is seen to be central to the effectiveness of strategy implementation. Thorman (1995a) recommends that each RES formally includes a management strategy, an action plan and a monitoring and evaluation framework, as well as supporting material and a community poster or broadsheet.

Seven of the nine initial RES projects received funding, including: the South West (WA) Local Government Association; the Southern ROC (South

Australia; SA); the Northern Economic Wedge (Victoria); the Illawarra ROC; the Northern Rivers ROC; the Eastern Downs ROC; the Far North Queensland ROC; and the Green Web (Sydney). Other projects similar to RESs are also being funded by Environment Australia, though these are being administered by VROCs and other regional planning structures such as REDOs, regional development boards and land councils.

ALGA is also working with Greening Australia on “a project to enhance the capacity of regional organisations to integrate natural resource management and regional economic development” (ALGA 1996:2). ALGA hopes that this work will follow on from RES processes. Greening Australia undertook a series of workshops during 1997 to assess the relationship between various regional approaches (including catchment management), VROCs and REDOs (ALGA 1996:2).

4.5 Institutional Arrangements in the Community and Industry Sectors

A number of regionally-based institutional arrangements in the community and industry sectors are also supportive of regional resource use planning activities, although they vary widely among the groups involved in these sectors. Stewart (1996:51), for example, discusses the recent formation and regional structure of the North Australia Beef Research Council. The council was established following a meeting of producers, researchers and funding bodies interested in ensuring that research meets industry needs.

Seven regional committees across Queensland, the Northern Territory and Western Australia have representation on the council. The council takes a broad view of R&D and Stewart (1996:52) considers that, through its regional structures, it will enhance technology transfer through existing extension mechanisms. The council recently finalised a strategic plan which is backed by individual regional plans for R&D (see NABRC 1994).

The conservation and human service sectors generally have organisational structures that deal with environmental and social issues at the regional level. Similarly, community-based Aboriginal interests in land and natural resource management are either directly dealt with by representative bodies established under the *Native Title Act* or by regionally-based Aboriginal land and natural resource management agencies (eg. see KALNRMO 1994).

5. An Assessment of Regional Resource Use Planning in Australia

In chapter 4 we explored the institutional arrangements for regional resource use planning in Australia and three other industrialised countries. In this chapter, we analyse these arrangements against the elements and principles of regional resource use planning established in chapter 3. In doing so, we draw on the relevant Australian and international literature and planning documents. We also examine three case studies in detail: the Cape York Peninsula Land Use Strategy (CYPLUS); the comprehensive regional assessment (CRA) being applied in forest planning in south-eastern Queensland; and the planning activities of the Murray–Darling Basin Commission.

The case studies are not intended to provide a fully representative sample of regional resource use planning activities. They were selected because they represent some of the most substantial regional resource use planning activities—past and present—in Australia. They include components covering the range of regional planning elements and principles established in chapter 3. They continue to operate, making them significant in the contemporary debate about best practice. They cover a range of resource use planning typologies, including one based on a unique biogeographic/ cultural region, one based on sectoral considerations (ie. forestry resources), and another based on macro-catchment boundaries. All three deal with resource management issues of national importance. Finally, as this review is not a primary research exercise, it was important to choose case studies which have already been subject to substantial academic and policy debate.

In our analysis, we find that there are major deficiencies in the current practice of, and government commitment to, regional approaches to regional resource use planning across Australia. Most approaches have been highly centralised, at best applying participative models designed to coopt stakeholders rather than to establish genuine

frameworks for negotiation of resource management issues. Where stakeholders are involved, their involvement tends to be under-resourced. As the CYPLUS example demonstrates, even in situations where participant funding has been applied to stakeholder group involvement, significant administrative tensions can arise between the central government agencies facilitating regional planning and stakeholder groups on the ground.

Regional resource use planning approaches have also tended to be highly technocratic, with a strong focus on the collection rather than the analysis of data. Stakeholders rarely have an input into prioritising those data requirements which would most effectively support negotiation processes. GIS has tended to be used purely as a technical tool for spatial analysis, rather than to inform the negotiation process. Existing IT opportunities have been under-used, despite their potential to support resource management negotiations. There generally has been poor integration between the social, economic and environmental components of planning, with most regional processes being focused on only one of these themes; and often working at cross purposes with the others. More effective techniques for environmental and economic assessment are rapidly evolving, though there has been a limited uptake of these technologies and methods in practice. Most importantly, however, there are considerable lags in the development of effective techniques for social assessment at the regional level.

Even where stakeholders are involved in regional negotiations, resources allocated to ensuring that there is effective and equitable participation of constituents within stakeholder groups are generally limited. In some cases this has led to new inequities being imposed upon marginalised or disadvantaged groups in the community. The same limitations exist in attempts to engage the general public beyond the defined role of key stakeholder groupings; in some

cases to the extent that public consultation has not influenced regional planning outcomes.

Some evolving experiments in regional resource use planning are currently seeking to address these deficiencies. It is hoped that, in the coming years, these activities will collectively redefine regional resource use planning, and provide an improved basis for sustainable, equitable and economically viable models of land use in Australian rangelands and other biogeographic zones. From this chapter, we would suggest that there is much work to be done in the development of effective techniques and procedures to get better outcomes from regional planning.

5.1 Technical Considerations in Regional Resource Use Planning

Many regional planning exercises suffer from a lack of rigour in their assessment of social, economic and environmental factors (eg. see Craig 1994; Jones and Thornthwaite 1994). This section analyses the application of information technology, environmental, social and economic assessment methods within regional resource use planning in Australia.

5.1.1 The application of IT within regional resource use planning

As described in chapter 3, information technology has considerable potential within regional resource use planning processes for better informing decision-making processes and developing procedures to assist negotiations relating to the allocation of environmental resources and services among competing and conflicting uses. In Australia, however, IT applications have had a limited use in regional planning in general. Integrating and using relevant information in regional resource use planning processes has been characterised by a number of technical difficulties, and limitations on the scope of decision support that is currently provided.

Trade-offs in information provision

Across Australia, the information and data available vary greatly in terms of a range of diverse attributes of relevance to regional resource use planning and to the development of innovative IT applications. These attributes include: (i) the depth and complexity of the information (ie. general to highly technical); (ii) the precision of the data (particularly in respect of the context of intended use); (iii) the data type (eg. qualitative, quantitative, digital, vector, raster, model, hard map); (iv) the spatial and temporal scale of the

data; and (v) data ownership and/or custodianship (eg. agency, sector, interest group). The user context (eg. individual, single interest group or multiple interests) and the level of abstraction of the information required by the user (eg. for a land use system, or single land type) also vary. Given this variability, a number of trade-offs in information provision and decision support for regional resource use planning often have to be made concerning:

- *the accuracy and completeness of available data sets* (such as time series, disaggregated survey data, longitudinal data, technical robustness, data currency; see eg. Nijkamp 1990; Hunter and Goodchild 1994; Damman *et al.* 1995:230);
- *the integrity of transformation of data* (eg. integration of data layers across time, space, academic disciplines and the digital representation of spatial data layers; see Aspinall *et al.* 1993; Veregin and Lanter 1995);
- *the equity of data sharing* (such as legal issues of ownership, custodianship, and use; privacy rights; freedom of information rights; eg. Smith 1994; Musto 1994; Cho 1994; Evans 1994);
- *the cost of data and information* (such as collecting, acquiring, accessing data across dispersed agencies/custodians; eg. Detrekoi 1994; Damman *et al.* 1995);
- *the required quality of the information system* (such as efficiency, flexibility, coherence; eg. Nijkamp 1990; Cho 1994);
- *the complexity of the choice problem* (such as coordination, conflict resolution, public participation; eg. Nijkamp 1990); and
- *the sophistication of technology development required for the intended use* (such as user-friendliness, costs/benefits of IT system development, required technical skills of users; eg. Wyatt 1994; Smith 1994; Sommers 1995a,b).

The frequent use of these trade-offs suggests that regional resource use planning in Australia has an integrity and consistency problem, including difficulties arising from: the compatibility and comparability of data; reliability and relevance of information; the accessibility and equity of data or IT system use; and the user-friendliness of IT systems to diverse users. These deficiencies have major implications that need to be assessed and managed if IT applications are to have a useful role in improving regional resource use decision-making, as well as providing effective support in negotiations relating to

policy development, implementation, and monitoring.

Support for spatial representation and analysis

To date, the primary use of spatial information technologies such as GIS and remote sensing in regional resource use planning has been in obtaining “snap shots in time” of landscape patterns (eg. Michener *et al.* 1994). These technologies are frequently used for spatial analysis of data and modelling at a single point in time (often in combination with standard statistics and geostatistical packages, as in CYPLUS). In order to address the broad spatial scales and long-term focus of regional resource use planning, new opportunities lie in using such tools for examining “change” at broad spatial and temporal scales. Ecological research and environmental management and planning, however, have yet to take full advantage of opportunities provided by spatial analytical tools and modelling capabilities linked to GIS (Aspinall 1994).

Support for visualisation

Data visualisation can play a significant role for IT in regional planning. In practice, visualisation tools have been used to assist in the compilation of large and complex natural resource data sets, both by natural resource scientists seeking to better understand their science, and by social scientists seeking to better understand human behaviour in relation to those resources (Orland 1994). Data visualisation techniques can assist in the comprehension of large biophysical and socio-economic databases, in interpreting dynamic changes in the environment, and in evaluating the implications of different management options (Fedra 1994; Orland 1994).

While many GISs in Australia have the capability to enhance environmental visualisation, as yet, they have not provided an effective stand-alone or integrated visualisation platform (Bishop 1994). This is particularly the case for natural area and forest management. There is also a recognised need to establish the reliability and validity of visualisations in IT applications (Orland 1994). Resource use visualisations need to be physically accurate representations of the real world and to provide views of regions or landscapes which people will realistically evaluate (Bishop 1994). As such, there are substantial opportunities for the use of visualisation within innovative IT applications for regional resource use planning. In particular, greater use could be made of IT in broader decision-support systems, including linkages to environmental process, economic and other relevant models.

Common focus on inventory, single issue and on site cases

Although the use of IT is increasing in rural decision-making (eg. finance and production systems modelling and analysis), IT in regional planning in Australia to date has predominantly focused on providing tools for decision support in land/property, infrastructure, and resources inventory, and for the interrogation, display, and basic analysis of that information. Applications have predominantly been focused on natural area (ie. parks and reserves) and forest management planning contexts, rather than on an integrated multiple use planning. In these situations, the primary use of IT applications has been to provide an objective technical description of the characteristics of an issue based largely on data collected by technical ‘experts’ within public agencies for specific sectoral or single-issue applications. Notably, there has been little use of advanced IT applications, such as knowledge-based systems, to take advantage of the full breadth of information sources available, including ‘non-technical expert’, and other qualitative, uncertain and/or incomplete information.

Stage I of CYPLUS, a substantial project (subsection 5.5.1), for example, focused on data capture, database establishment, and the display and visualisation of information within a GIS framework (McNaught 1994). There has been only limited linking of this information to analytical tools for modelling natural resource system components, and it has had little use so far in integrated approaches to the assessment and evaluation of alternative policy, planning and management approaches.

Similarly, the use of IT applications in support of sustainable resource use in Australia has tended to focus on the evaluation of management options for specific sectoral uses in terms of their on-site environmental impacts. Limited attention has been given to the application of IT in evaluating off-site environmental, economic or social implications or the opportunities for multiple uses. In this review, we found no applications developed to comprehensively address on-site impacts and off-site implications of resource use at a regional or catchment scale.

Support for land use allocation processes

A potentially useful planning system developed in Australia that integrates environmental data and other information at a regional scale is the SIRO-PLAN methodology (Cocks 1984; Ive 1992). The SIRO-PLAN approach has undergone substantial refinements since its first introduction in the late 1970s. It is a methodology for assessing zoning

options for land use allocation under the control of a single agency with a single set of values or policy guidelines. It takes into account the site-specific land attributes of the region. It uses decision tree and/or attribute rating and weighting methods to solve site selection for land use. Alternative uses for a site can be selected only if the consequences of a particular land use can be maintained within an agreed range with respect to preset criteria of acceptable change.

The SIRO-PLAN methodology is based on the classical, rational approach to problem-solving, namely: define alternatives, evaluate alternatives and select the alternative with the highest value (Cocks 1984; Laut and Davis 1988). This approach involves: (i) developing guidelines for making zoning decisions; (ii) devising methods for measuring whether a scheme satisfies those guidelines; and (iii) using a microcomputer-based spatial decision support system, called LUPIS, to identify the preferred land use or management regime based on rating and weighting techniques through an iterative process of evaluation of alternative schemes.

To date, LUPIS has had limited acceptance in regional planning. It has been used to provide decision support in a number of single-issue-driven planning settings in Australia. These include the development of regional zoning for natural area planning (ie. for parks, reserves and forests), and land use zoning for local government statutory plans (eg. Cocks 1984; Laut and Davis 1988). Two experimental projects (LWRRDC-funded projects in the WA Goldfields and the Western Division of NSW) are currently exploring its strengths and weaknesses in rangeland regions.

LUPIS's limited use does not reflect the potential benefits of the approach. These include that: (i) it provides a mechanism for seeking public contributions to the planning process (Cocks 1984); (ii) it focuses attention on specific areas of land use conflict by evaluating the preferred land use plan with participants (eg. Hock 1994); and (iii) it highlights the policies being used to produce plans and catalyses policy discussions through the need for explicit statement of guidelines (Laut and Davis 1988; Conacher 1994). Another strength of the SIRO-PLAN method is that it "relies heavily on the ability of the planning agency or the client to make explicit political judgements, and to trade-off the demands of disparate interests" (Cocks 1984).

Nevertheless, the SIRO-PLAN approach has limitations that must be considered. These include: the difficulty of reducing to numbers many of the considerations inherent in drawing-up a zoning

scheme; the lack of a satisfactory mechanism for explaining the basis of a proposed plan (ie. a justification or accountability mechanism; Laut and Davis 1988); its limitations in situations with multiple-interest groups with evolving sets of values; and its inability to deal with land use interactions. To address these deficiencies, SIRO-PLAN's developers have recently modified the approach and associated LUPIS software for use as an information-based mediation/negotiation support system (Cocks and Ive 1996; Ives and Cocks 1996). This new approach is called SIRO-MED (CSIRO Mediation and Negotiation Support System):

It is for assisting contending stakeholders (interest groups, parties) reach agreement as to how large areas of land valued, at least in parts, for competing land uses can be used in a way which ensures that the most important demands of all stakeholders are realised in accordance with their contrasting economic, social and environmental values. (Ives and Cocks 1996:1)

SIRO-MED has been applied recently to help resolve forest allocation disputes (Cocks and Ive 1996). While it is a serious attempt to develop "a science-based social technology for supporting the mediation process, it remains to be evaluated in a contentious real world context" (Ive and Cocks 1996). Nonetheless, the greater use of IT applications to allocate land uses have the potential to facilitate interactive involvement of various stakeholders in planning land allocation (Conacher 1994; Ives and Cocks 1996).

Lack of multi-objective IT approaches

IT applications for natural resource use planning and management in Australia have in general not focused on providing information that enables the linking of ecological system processes with techniques for evaluating priorities for action in multi-criteria contexts. In particular, there is a dearth of effective support tools for evaluating the environmental, economic and social trade-offs that are characteristic of regional decision-making in rangelands (eg. LUPIS, IDRISI). Trade-offs may exist, for example, between a variety of potentially conflicting and competing resource uses "to explore the regional benefits of different combinations, different balances of various enterprises, in various patterns of use" (Walker 1996). Resource uses need to be assessed in terms of "values" ascribed to rangelands by different stakeholders, such as pastoral, biodiversity, ecological services (eg. tourism, recreation), defence industry purposes, and cultural and aesthetic/existence values. There are, however, few multi-objective IT approaches currently being used for regional resource use planning.

Lack of planning of the IT innovation development process

Despite considerable potential, GIS and other technologies have been little used in analysis beyond data storage and retrieval. In evaluating the low use of GIS technologies in natural resource management in practice in Victoria, Smith (1994) identified a lack of formal planning in the IT development processes as a major issue. Similarly, there has been an apparent lack of proper planning and identification of the information needs for IT applications in regional planning, and only limited involvement of stakeholders in the planning and development process. As will be shown in section 5.5.1, the CYPLUS project, for example, did not review, at the start of the project, the information needs of the broad range of stakeholders required to support CYPLUS goals. Rather, CYPLUS essentially involved the collection, representation, integration and basic analysis of data on regional resources by technical experts, largely in the expectation that this information would be used for decision support by predominantly government/public agencies.

Most applications of IT for regional planning in Australia have been based within centralised approaches to public participation, significantly constraining the process of IT system development and use. There has been a general lack of effective involvement of stakeholders (other than government and related agencies) or of realistic assessment of the costs and benefits of the IT, in the systems development processes. Consequently, there is a need to better understand the contribution of scientific and other technical information in public policy and community decision-making to effectively address ecological sustainable development, and how IT can be used in this process.

5.1.2 Environmental planning and assessment within regional resource use planning

Any evaluation of the integration of environmental issues in regional resource use planning is hindered by the fact that regional planning has often been undertaken in broadly non-integrated themes of environmental protection, economic development and social development. While the economic and environmental considerations have been predominant, an emphasis on regional economic development and growth management has frequently overshadowed the importance of environmental considerations. Even at the international level, disciplinary and institutional integration in regional planning have rarely been achieved (see Slocombe

1993:289). Certainly, the 'ecosystem' approaches recommended by Slocombe (1993) could not be identified in any of the regional resource use plans we reviewed, perhaps with some exceptions in World Heritage planning activities (see Lambert *et al.* 1996).

At the other end of the spectrum, many of the regional plans we reviewed (particularly World Heritage plans) have focused entirely on environmental assessment at the expense of economic, cultural and social considerations. We found no clear examples that reached the middle ground in cross-disciplinary integration, although the SEQ200, FNQ2010 and Wide Bay processes had (albeit poorly integrated) social, economic and environmental strategies. As Slocombe (1993:289) notes:

Planning for development remains largely the work of economists and mainstream urban and regional planners, while planning for the biophysical environment remains the separate work of environmentalists, ecologists, and resource managers of various kinds...in spite of the fact that it is at the regional and local level...that conflicts between environmental conservation and development planning become most apparent.

Again, as in Canada, a separate discipline and profession of environmental planning has tended to emerge, rather than a broadening of the integrative strengths of mainstream planners.

The strength of baseline environmental assessment

As was found in Canada by Slocombe, regional environmental planning has tended to be more descriptive and science-based than mainstream planning. There has been a tendency for regional environmental assessment to be focused on survey methods for identifying and presenting environmental constraints and opportunities, rather than on broader systems analysis. While these activities provide a sound basis for environmental planning, Slocombe (1993:291) considers that they are not environmental planning in themselves. He considers (Slocombe 1993:291) that:

Adding ecological or environmental information to planning is not really enough. It may result in somewhat fewer truly bad decisions, but until the analysis goes beyond multidisciplinary lists and is an integral part of a comprehensive, forward looking planning process, there is neither a basis nor an incentive for true linking of environment and development.

Briassoulis (1989:390) concluded in her review of environmental planning that the body of environmental planning theory is still meagre. Particular limitations arise because much ecological

theory is site-based, taking insufficient account of spatial variability as an intrinsic property of ecosystem function (Nick Abel, pers. comm. 11/3/1997). Indeed, one of the main limitations to the integration of ecosystem theories into regional planning has been that most ecological work has evolved and been applied at the site level, ignoring spatial relationships. In Australia, the bulk of environmental assessment has been tied up in site-orientated environmental impact assessment processes.

Bioregions as a basis for planning

While there is substantial work being undertaken at the moment to define Australia's bioregions as a stronger basis for regional resource use planning, our review suggests that regions are still far more frequently defined on the basis of administrative and economic factors rather than bioregional considerations. The clear exceptions are planning activities within World Heritage area boundaries, but this in itself presents an integration problem. World Heritage plans are often strictly environmental management plans developed from the perspective of the responsible authorities (see Lane *et al.* forthcoming). Even in these cases, the incorporation of entire functional ecosystems within planning boundaries has been limited. In the case of the Great Barrier Reef Marine Park Authority, for example, Lambert *et al.* (1996:51) state:

The Great Barrier Reef illustrates the enormous land/sea 'barrier' which exists in planning. Despite all the sophisticated planning of the Great Barrier Reef, the greatest threat to its biodiversity is from land uses on shore over which the Great Barrier Reef Marine Park Authority has no planning authority.

Population thresholds and carrying capacity

Perhaps one of the most fundamental technical flaws within Australia's regional planning activities to date has been the lack of clear research, analysis and debate regarding the population and production thresholds of regions as a basis for further regional activity. Despite its critical relevance in fast-growing regions, planning activities sparked by rapid population growth have generally avoided debates about carrying capacities (eg. SEQ2001). Debates concerning limits to production, however, arise more in regions where resource degradation has underpinned the regional planning activity (eg. see Holmes 1990; MacIntyre and McIvor 1998).

One of the most widely held criticisms from the environment sector regarding the SEQ2001 process has been that it started from an *a priori* assumption that the rate of population growth in the region was a

given. The exercise was focused on *managing the impacts of growth* rather than on *managing growth within acceptable limits*. In the view of the environment sector, its effort to entrench concepts of sustainable population growth within SEQ2001 was lost early in the RPAG process (Rosie Crisp, pers. comm. 11/3/97). By not at least recognising ecological limits to growth in the region, SEQ's policy options perhaps remain fundamentally flawed. Similarly, while FNQ2010 did some background analysis of growth thresholds, there was strong reluctance from local and State government to allow these factors to influence the resultant RFGM and sectoral strategies.

Environmental indicators and adaptive management

Monitoring is an essential part of adaptive management. It provides "a basis to track fluctuations in specified components of the environment and, thereby, evaluate the utility of management regimes for achieving sustainability goals" (Norton and Nix 1996). To allow adaptive approaches, monitoring regimes need to establish practical feedback mechanisms on the short and long-term effectiveness of management interventions. Despite its importance, however, environmental monitoring is often poorly integrated in resource management. In 1992, for example, the OECD Report on Sustainable Agriculture identified the lack of feedback mechanisms and strategies to deal with on-farm problems as one of the most critical barriers to change to more sustainable resource management in many countries.

Wilcox and Cunningham (1994) have identified the lack of a means for objectively appraising progress towards sustainable use of Australia's rangelands as a key knowledge gap. They consider that there is a particular need for reliable sustainability indicators. For technical, practical or economic reasons, however, it is usually possible to monitor only a fraction of what is going on in the environment. Both nationally and internationally, there is currently a substantial R&D 'industry' searching for pragmatic and timely indicators of sustainability. The search is for indicators capable of informing the implementation of management strategies and influencing policy decision-making (eg. Hamblin 1992; SCARM 1993; Walker and Reuter 1996). Indicators of sustainability are, however, scale dependent, both spatially and temporally (Pickup and Stafford Smith 1993; Campbell 1995). What may appear to be sustainable at one scale may not be so at another. Similarly, what is sustainable in the short term may not be so in the longer term. The use of the

term 'sustainable' itself remains imprecise unless it is defined by boundaries of space and time (ie. the ability to maintain ecosystems at what physical scale and for how long; Lefroy *et al.* 1993).

The pressure–state–response (PSR) framework (eg. OECD 1992) is used in Australia for State-of-the-Environment (SoE) reporting at both the State and national levels (DPIE 1994). In this approach, indicators are used to assess pressures (from human activities on natural systems), states (the condition of the natural system including changes over time), and responses (by society and the environment to the pressures and changes in state). The PSR framework therefore links pressures on the environment as a result of human activities with changes in the state of the environment. In this model, society then responds to these changes by implementing environmental and economic programs and policies, which feedback to reduce or mitigate the pressures or to repair the natural resource.

A number of practical problems have been identified with PSR approaches. These include: lack of data or accessibility to evaluate PSR elements; problems may be evident whereas the causal factors are not; the complexity of some issues defies certainty; long time lags exist between causes and environmental or socio-economic symptoms becoming apparent; and questioning traditional practices or ways of doing business tends to threaten vested interests. In Australia, the focus on indicators and monitoring systems has been predominantly on the assessment of the current condition of the environment, including the description and monitoring of trends in components and functioning of the natural system. There has been little success in linking these assessments to:

- information that permits an understanding of the natural and human-induced causal factors, rather than the immediate causes of the overt symptoms (Alexandra *et al.* 1996);
- appropriate and timely priorities for action (Bellamy *et al.* 1996);
- the needs, values and belief systems of organisational and other community cultures (Bellamy and Lowes 1995); or
- institutional support structures and processes in a timely and pragmatic way (Alexandra *et al.* 1996).

These problems with monitoring limit the ability of planning agencies to adopt adaptive management regimes. Even in cases where reasonable monitoring appears to be occurring, the poor success in linking problems identified to appropriate institutional

responses has limited adaptive outcomes. Planning in the Great Barrier Reef perhaps illustrates one of the more adaptive structural arrangements for transferring improvements in knowledge to revised management actions (Lambert *et al.* 1996:51).

Lack of practical strategies for implementing integrated approaches

Integrated approaches to environmental management and planning are in their infancy and largely experimental. Much of the conceptual development and experience in Australia relates to catchment management (eg. Syme *et al.* 1994; Mitchell and Hollick 1993; Margerum 1996). These concepts, however, have proved very difficult to translate into practice. Integrated environmental management is an evolving concept lacking a well-defined body of guiding principles capable of general application (eg. Lang 1990; Grinlinton 1992; Margerum 1996). In particular, there are few practical strategies for guiding implementation. Some of the key issues relating to implementation include:

- practical problems of integrating disparate information across time and space, as well as different judicial, institutional and academic disciplinary boundaries (eg. Stafford *et al.* 1994). This inhibits the integration and sharing of information to foster coordinated action on a particular issue;
- the mismatch between the character of the problem and available analytical approaches or institutional arrangements (eg. Stafford and Michener 1994; Dovers 1996);
- the common mismatch between the technical information available and decision-making needs and contexts (eg. Bellamy and MacLeod 1998);
- the inability of the public to fully participate in decision-making processes, because of ineffective institutional structures (eg. Grinlinton 1992; Hardin 1996);
- the lack of comprehensive integration of legislation, administrative responsibilities and operational management that would reflect the complexities and interrelatedness of the various elements of the natural and human resource systems (eg. Grinlinton 1992).

In general, integrated approaches to environmental management and planning in Australia have so far focused on addressing either single, non-regional issues (eg. dryland salinity; point source pollution) or sectoral or single interests. These fragmented approaches must be replaced with ones which lead to

better integration of the management of our natural resources, but which at the same time provide reliable information flows for planning new land uses and, using performance indicators, monitor how they perform (eg. O'Callaghan 1995). There are considerable opportunities for the development of improved methods and frameworks for guiding such regional approaches.

5.1.3 Social planning and assessment within regional resource use planning

With the exception of specific regional social development processes, social considerations remain poorly resourced and researched within regional planning activities in Australia. Brian Cheers (unpublished) of the North Australia Social Research Institute states bluntly that regional development is dominated by economic considerations to the neglect of other aspects of human well-being. Following a short review of R&D in regional planning in northern Australia, ASTEC also lamented that lack of social analysis, commenting (ASTEC 1993:54) that:

The issue of social impact assessment is a crucial component of regional studies since it ensures that the human side of the ecosystem functioning is considered in environmental management.

Where social issues *have* been dealt with in regional planning, it has often been the 'poor cousin' to environmental and economic considerations. Reddel (forthcoming:31), for example, found that during the SEQ2001 process, statistical data concerning the demographics of the region's population and the services within the region were seen to be underdeveloped, limiting the effectiveness of the resultant policies. Our review of regional plans across Australia suggests that, by comparison, SEQ2001, FNQ 2010 and Wide Bay 2020 paid considerably more attention to social issues than did most other regional planning activities.

It is important to draw upon the literature concerning regional social infrastructure planning to analyse what is happening in Australia in regard to the integration of social issues in planning. Jones and Thornthwaite (1994) review "experiments in regional social infrastructure planning across Australia, and particularly in Queensland". They evaluated these processes from three perspectives: human services and facilities; social development processes; and patterns of human settlement. The primary limitations found by Jones and Thornthwaite in each of these areas are outlined in Table 6. Factors that also need to be considered, however, include the institutional arrangements for supporting social planning and the

incorporation of cultural heritage considerations in planning.

Much of the discussion in sections 5.3 and 5.4 refers directly to social development processes (eg. negotiation between stakeholder groups and participation within them). While these processes are often identified as a central component of social planning, they are better viewed as fundamental to the overall process of planning from a social, economic and environmental perspective.

Human services and facilities

The definition of human services and facilities needs to be clear in regional planning. Jones and Thornthwaite (1994) found that narrow definitions tended to result in key human service areas receiving scant regard in many of the processes they reviewed. There has been a tendency to view human services as macro-institutions such as schools, hospitals and tertiary facilities rather than more broadly incorporating a wide range of services delivered at the community or neighbourhood level. The result has been limited attention paid to the distribution of these services across regions.

Jones and Thornthwaite (1994:102) consider that while standards and benchmarks exist in some service types (eg. primary and pre-schools), they are poorly defined or non-existent for other service types which do not have direct linkages to demography (eg. specialist services). Despite the clear linkages between population growth and service demand (see Briggs 1992), limited progress has been made towards integrating land use planning and development assessment with human service delivery and planning. Dale and Lane (1995) suggest that the establishment of Queensland's Social Impact Assessment Unit as a land use planning referral agency in part reflected the impacts from rapid economic change (eg. rapid urbanisation, rural decline, etc.) being felt by welfare agencies. Even so, the unit has only recently started work to better link social infrastructure planning with regional planning processes by formalising the links between development and service delivery impacts.

Human settlement patterns

Jones and Thornthwaite (1994:104) state that while there has been wide debate about the integration of social goals in regional land use planning, there has been insufficient debate about "which goals it needs to address". They find that while the issues of distribution, equity and social justice should be given central attention, they are often secondary to goals and objectives relating to overall quality of life within regional communities. Further, they consider that

Table 6. Limitations in Australian experiments in regional social infrastructure planning

Component of regional social infrastructure	Limitations
Human services and facilities	<p>A need for greater clarity in the definition and classification of human services and facilities.</p> <p>A need to develop standards or benchmarks for regional human services and facilities.</p> <p>A need for greater integration of the planning of human services and of patterns of human settlement.</p>
Social development processes	<p>A need to acknowledge the diversity of social development processes and arrangements among regions, and to build upon existing arrangements.</p> <p>A need to clarify the purpose of community participation and consultation. Social development processes should be designed with a focus on desired outputs and outcomes.</p> <p>Many processes experience great difficulties in involving disadvantaged and marginalised groups.</p> <p>A need to view social development processes as encompassing implementation and delivery of services and programs as well as planning and policy development.</p> <p>Social development processes need to be adequately resourced to achieve the tasks and objectives espoused.</p> <p>Non-authoritative regional planning processes need to maximise their influence on decision-making and resource allocation.</p> <p>Regional social development planning must give adequate representation to all organisations that are important in achieving the stated outcomes.</p>
Patterns of human settlement	<p>There is a need for more wide-ranging debate concerning social goals and regional land use planning.</p> <p>Issues of distribution, equity and social justice need to be given central place on the agenda.</p> <p>There is a need to move beyond broad social goals to the development of specific implementation strategies and processes to achieve social outcomes.</p>
<p>Source: Adapted from Jones and Thornthwaite (1994:102–104).</p>	

there is a need to “move beyond the elaboration of broad principles and objectives, to the development of specific implementation strategies and processes to achieve social outcomes”.

Lack of appropriate institutional and administrative structures

Institutional structures to assist the integration of social issues in regional planning are limited throughout Australia. In Queensland, for example, a critical inquiry into land use planning (CICMUFIGSR 1991:114) acknowledged that, in the early 1990s, the administrative structures for development assessment and land use planning provided limited access to expertise to ensure the promotion, administration and monitoring of social considerations. None of the existing coordinating agencies held particular expertise in social planning that could be applied to land use planning and development assessment on a systematic

basis. Neither was there any formal mechanism for those line agencies with expertise in a range of social programs to be involved in land use planning. This problem remains a significant impediment to the incorporation of social considerations into regional planning throughout Australia and internationally. The non-involvement of social infrastructure agencies in land use planning has traditionally been a result of their marginal position within government at the Federal, State and local levels. The benefit of bringing such agencies into the mainstream of development decision-making is likely to encourage more effective multi-disciplinary teams in regional planning.

Institutional problems in regional planning are compounded by a lack of skilled practitioners with experience in social aspects of regional planning at all levels. This shortage affects the Federal and State governments, many local governments, and

development and consultancy companies. Few local governments in Australia, for example, have social planners employed within their town planning departments. Some councils are increasingly drawing upon expertise within their community services or community development departments (if they have such) to contribute to planning and development assessment activities. Very few councils or State agencies have effective systems for integrating social issues into land use planning. Consultancy teams undertaking regional planning work will often subcontract teams with specialist social planning skills, or else attempt to undertake social assessment using their environmental and project management skills (see Dale 1995).

Culture and cultural heritage

To date, cultural heritage issues have rarely been addressed within regional planning activities. Further, the identification and protection of cultural heritage in regional planning has been subject to scientific versus value-based conflicts. This conflict has most prominently surfaced in debates between Aboriginal communities, land use planners and archaeologists. In contrast to anthropology, archaeology as a discipline has tended to focus on physical manifestations of the cultural past of Aborigines (eg. quarry sites, burial grounds, etc.). This has marginalised the consideration of social and cultural values (eg. dreaming tracts, aesthetic considerations) in landscapes. Technical land use planners have tended to view such non-archaeological values of cultural importance to Aboriginal people (eg. story places, dreaming tracts, etc.) as simply another land use or planning constraint; able to be mapped and managed according to rational planning principles.

Areas of cultural significance to Aboriginal people, for example, are often part of a network of important sites and areas that define entire landscapes in cultural, social, spiritual and historical terms. Knowledge, ownership and management of these areas by key Aboriginal individuals and groups defines power relations and land rights within the Aboriginal community and other groups interested in exploiting land and natural resources. Transferring control of this knowledge to centralised technical planners effectively removes the ability of Aboriginal people to negotiate in the regional planning arena on equitable terms (see QDFYCC 1996b). The inability of regional planning to deal with this has underpinned increasing calls from Aboriginal communities for regionally negotiated agreements under the *Native Title Act 1993*.

5.1.4 Economic planning and assessment within regional resource use planning

Perhaps the most significant economic deficiency in regional planning in Australia has been the tendency to separate the social and economic development themes. Regional approaches to economic development have been focused on development-driven market economics, either through significant government investment in infrastructure or government incentives for private investment in the region. These approaches have been universally poor at balancing economic development with social and environmental considerations.

Furthermore, regional planning and regional models of economic development in Australia have been criticised for starting from flawed assumptions about the nature of regional economies, and for being based on outdated notions of regional development through limited models of government investment in infrastructure. These criticisms peaked following the release of the Kelty Report in 1993. Guille (1995:23) notes that there were a number of attacks on the Taskforce Report for what is said to be its “out of date Keynesianism” and its “shopping list of projects”. He counters these debates by considering the Kelty Report as a “welcome departure from the advance of pure market liberalism” and a challenge to the inevitable inequities that would befall remote and poor regions when economic efficiency overrides economic equity (Guille 1995:28).

Given the key elements and principles of regional resource use planning outlined in chapter 3, this review takes the view that the debate between regional interventionists and the pure market economists needs to balance both equity and efficiency considerations. It works on the premise that regional economic planning is needed both to direct equity-based government spending and to empower regions to improve their own economic position. In this context, a number of limitations have been noted in critiques of existing regional planning activities. In relation to SEQ2001, for example, Craig (1994:12) states that:

RPAG’s task was based on a series of dubious (economic) assumptions, making it impossible to reach meaningful conclusions. RPAG was commissioned only to deal with the broadly defined “real estate” implications of population growth. Though economic growth was considered in doing so, the project was fatally weakened by ignoring economic development. Thus, RPAG’s proposals could neither ensure economic prosperity, nor provide for the deeper tax base needed to finance the suggested higher environmental and service standards.

Craig (1994:13) raises a number of deficiencies in the economic analysis underpinning SEQ2001. Significantly, these included the fact that the process: (i) did not establish effective machinery to deal with economic development; (ii) did not look at external economic factors affecting the region; (iii) focused on industry location rather than industry feasibility; and (iv) did not have adequate strategies to foster economic growth within the region. Also, it assumed that rapid population growth would positively impact upon economic development.

Similar limitations have existed in one form or another in other regional economic development planning activities throughout the country. Another common deficiency in economic assessment at the regional level is the common failure to account for non-market values in regional economics.

5.2 Procedures and Negotiated Processes

Regional resource use planning activities in Australia have broadly been based on centralised, rational planning models (eg. see Cowell 1996:74). This contrasts with the predominant preference for non-authoritative processes found by Jones and Thornthwaite (1994:103) in regional social infrastructure planning. Only in recent years have regional planning procedures improved in some domains, but even these tend to be limited models of centrally controlled participation (eg. forest-based comprehensive regional assessment processes, SEQ2001 or FNQ2010). Few processes have actually moved to establish enhanced institutional arrangements for facilitating negotiated planning. Significantly, this has been noted by ASTEC in its recommendation (ASTEC 1993:54) that:

Regionally based strategic land use and environmental planning in tropical Australia should be reviewed and rationalised, with the establishment of mechanisms that require the involvement of all the major stakeholders ... in the strategic processes for particular regions.

Reddel (forthcoming) undertakes a detailed analysis of participatory elements of planning activity using three case studies including SEQ2001 and regional social planning undertaken by the Mackay Regional Council for Social Development. Given the significance of SEQ2001 in terms of its progressive contribution to participatory aspects of regional planning in Australia, Reddel finds an interesting paradox. He considers that while the approaches taken to stakeholder participation were innovative for their time, in reality, they were structured as a

mechanism for informing centralised and technocratic planning. He considers that, by and large, the stakeholder participation processes used were viewed by the State Labor administration as a concession to the “chattering classes”, allowing the Party to get on with the business of “good” government. Reddel (forthcoming:14) considers that, in this sense, Labor’s administrative processes were narrowly defined in terms of control and discipline. As a consequence, he considered that “wide ranging community and indeed public sector debate is not encouraged as the centralised management of the policy and political process is essential to the Government”. In both the SEQ2001 and FNQ2010 processes, despite representation on the RPAG, both the environment and human service sectors considered the debate often became a process of negotiation between State and Commonwealth agencies, rather than between the government and non-government organisations with a stake in resource management.

The most significant issue to consider in setting up representative participatory forums for establishing regional policies is that, while they are structured to facilitate negotiation between sectors, the recommendations of RPAG-style bodies have themselves, by and large, been treated as “advisory” documents by State and local government (eg. see Reddel forthcoming:30). Results negotiated in these structures do not assure the implementation of decisions reached. Neither do they establish a mechanism to renegotiate significant modifications to implementation strategies.

The issue of equity in negotiations is not restricted to government versus non-government stakeholders. Certainly, the failure of the AAP approach to regional social development planning is often referred to as an illustration of the failure of centralist planning approaches imposed on other spheres of government. In reflection, Bill Hayden, the then Minister for Social Security stated (Hayden 1996:191):

If there is a need to tighten up the (regional planning) processes or to experiment with new forms of cooperation and administration between the State and the Commonwealth these can be achieved generally ... by joint planning and other agreements.

Because of the general lack of commitment by instigating agencies to see regional planning as a genuine opportunity for negotiated change, regional planning activities have often created structured arrangements for inter-governmental conflict rather than mutual cooperation. State governments have long feared Federal intervention in land use planning,

and they particularly fear that they will be bypassed by direct Federal sponsorship of various forms of 'regional government'. Local governments have generally feared that State governments will establish some form of 'regional government' to override local decision-making. These inherent fears remain among the greatest limitations to the widespread establishment of effective regional planning processes.

These are general observations. The following sections explore in more detail, whether or not negotiatory and procedural elements of regional resource use planning are meeting the best-practice principles established in chapter 3.

5.2.1 Government commitment to regional resource use planning

On the surface, the sheer number of regional planning processes outlined in chapter 4 suggests that there generally is government commitment to regional planning at the Federal, State, Territory and local levels. Both the lack of consistency between the approaches used and the general non-integrated themes applied, however, suggest that all levels of government lack a clear political and financial commitment to *integrated* and *negotiated* regional resource use planning. Martin and Woodhill (1995:177), for example, consider that, despite clear calls within the NLMP for greater government involvement, attempts at regional and catchment planning generally lack resources and have little coordinative capacity. In regard to the level of government support for these activities, they state (Martin and Woodhill 1995:182):

There is now considerable discussion and support for... regional planning and action in rural environments. Catchment management strategies are developing in most states and there is evidence of some small increases in funding for these broader scale activities. But compared to the extent of land degradation problems, the decline in water quality and continued vegetation clearance, the slow development of these broader initiatives seems more a symbolic gesture than a substantive commitment.

Similar concerns have been reflected at State level. Moon (1995) considers that processes such as SEQ2001 have failed because State and local government commitments to regional planning have often been subverted by vested (usually commercial) interests. Conacher (1994:360) cites Bennett (1985) in saying that, in NSW, questions have often been raised as to the level of commitment to regional planning by governments, with the track record of some planning agencies being characterised by crisis

response. One of the reasons that negotiated approaches to regional planning have generally been avoided could well be that governments would feel constrained by locking themselves into agreements negotiated with non-commercial and non-government sectors and agencies.

Woodhill and Dore (1997:8) make the useful distinction between government commitment to regionalisation rather than regionalism. They consider regionalisation as the process of government creating administrative regions for more efficient program management and delivery (eg. the formation of regional assessment panels for the delivery of NHT funding). Regionalism, on the other hand, they consider as a process whereby local communities develop the power to make or genuinely influence decisions affecting the region. To illustrate this, they cite McKinsley & Co (1996).

Although government agencies may be talking of empowering local communities, in reality many of their decentralisation initiatives are devolving program management and delivery without devolving any real authority. This leads to serious frustration within regional organisations.

5.2.2 Coordinating diverse institutional arrangements

In Australia, most resource management decision-making and action occur at the level of the individual land manager. Above this, government policies and programs remain the major determinant of resource use decisions. The responsibility for resource management and planning is subsequently fragmented, with basic resources such as soil, forest, land and water, fisheries and wildlife being managed by many different institutions at the local, State and Commonwealth levels (see McDonald 1992). This in itself, has been one of the major institutional barriers to improved procedural arrangements for regional planning activities.

The complexity of poorly coordinated agencies with inconsistent agendas has in cases led to the collapse of regional planning activities. Hayden (1996:186) considers that among the most significant contributors to the failure of the AAP were the arguments about territory and authority between the Department of Urban and Regional Development and the Department of Social Security. As a centralist planner, Tom Uren as the then Minister for Urban and Regional Development spent considerable money on land purchase and infrastructure development in regional centres such as Albury-Wodonga, Orange and Monarto (South Australia). Much of this land was later found to be surplus, and with the early failures of

the AAP in Orange and Monato, the land was sold below the initial purchase price. There was considerable competition between the two Ministers, resulting in poor program integration.

These institutional barriers are exacerbated by the general failure of attempts to successfully regionalise government processes throughout Australia, leading to conflicts in policy between regional and central government offices. Alexandra (1996a) outlines a number of impacts that failed, or 'de facto', regionalism has had upon resource management and planning. These include poor spatial and jurisdictional boundaries, lack of clear provision for democratic accountability and agencies operating with amorphous terms of reference and a poorly defined mandate.

5.2.3 Legislative and administrative arrangements

A number of problems with legislative and administrative arrangements for regional planning become clear from an analysis of the institutional arrangements outlined in chapter 4. In many jurisdictions, the institutional arrangements for planning do not clearly support *integrated* regional planning. They tend to support either separate economic development or environmental protection (eg. Queensland's Coastal Protection Act).

Legislation also rarely encourages negotiated approaches to planning. In Queensland, for example, the original regional planning provisions established under the Queensland's *Integrated Planning Act* provided a basis for more integrated approaches, but do little to ensure that regional planning will be well negotiated among stakeholders and balanced in terms of economic and social development and environmental protection.

Legislation also rarely structures effective linkages between planning and impact assessment. In NSW, for example, while the *Protection of the Environment Administration Act* required the Department of Environment and Planning to undertake both regional planning and impact assessment, it did not prescribe any relationship between the two activities, and regional plans were not specific enough to either guide or constrain proposed development activities (Duffy 1983, cited by Conacher 1994).

5.2.4 Organisational structures

Howlett's (1996) thesis concerning the importance of organisational context in land use planning illustrates a widespread limitation in the organisational arrangements established for regional planning. She

considers that while successful stakeholder participation in regional planning relies upon the redistribution of both information and decision-making power, in many situations, the organisations charged with responsibility for such planning often may actively seek to retain control and to determine planning outcomes. In her exploration of the CYPLUS project (see subsection 5.5.1), she concluded (Howlett 1996:iii):

This regional land and resource planning process embraced the rhetoric of modern planning and the need to include the public in decision making processes. Yet it was placed in a centralised organisational context which refused to share the decision making power with local stakeholders. A battle for control of CYPLUS evolved that was to see local stakeholder's interests marginalised and the interests of the state take precedence. Thus organisational context proved a powerful impediment to the implementation of key aspects of the planning process in the CYPLUS exercise.

In this particular case, there was significant conflict between the central State government agency responsible for the CYPLUS project, and the regionally-based task force established to undertake both technical planning and to facilitate stakeholder participation.

Another consistent theme in the literature assessing regional planning activities in Australia, however, is that the predominant focus of task forces or support units established to assist regional planning has tended to be on technical issues rather than on facilitating effective negotiation. Reddel (forthcoming:28) reports that in his interviews regarding SEQ2001, there was a perception that the focus of the government-based Technical Support Group was on technical matters rather than on negotiatory aspects of the process. In a comment that is symptomatic of this centralist organisational theme, Hayden (1996:190) is scathing of the planners that operated within regional social development councils, accusing them of establishing a form of welfare colonialism in disadvantaged or marginalised communities. He states (Hayden 1996:190):

As always with colonial powers, the occupiers would do best out of the arrangement. The AAP was based on middle-class values and created by middle class welfare planners, while it was supposed to be used by the marginalised and working class.

Additionally, the accountability and effectiveness of administrative structures established to facilitate regional planning have been questioned at times. Hayden (1996:188), for example, alleges significant

misuse and misallocation of public funds by some regional councils for social development.

Before too long, the process of men and women of goodwill coming together as members of the regional administering committees, as per the desired model, somehow became transformed into squalid little factional power struggles. There were notable instances of strife between the committees and the office staff over the conduct of programs, or more precisely, who would be in charge of them. Tensions occurred between the established positions of community groups, Local government and State government representatives.

5.2.5 Regional resource use planning's influence on decision-making

As a result of regional planning tending to be unisectoral or belonging to one particular agency, there has been a tendency for it to influence only the decision-making of those agencies directly responsible for undertaking the planning. In the absence of effective negotiated approaches, regional plans have tended not to provide a basis for guiding development assessment at the local level. Certainly, one of the intentions of the SEQ2001 process was that local governments were to sign an agreement with the State regarding implementation of the Regional Framework for Growth Management (RFGM), and use it to guide decisions made at the local level. Despite this, there is evidence of decisions being made by State and local government agencies in contravention of the RFGM principles (Moon 1995).

While this is a less than desirable result, it needs to be recognised that SEQ2001 is one of few regional plans that has sought to influence decision-making at the local level. Moon (1995:29), however, correctly suggests that local project decisions which override regionally negotiated consensus ultimately undermine the credibility of regional planning itself. Duffy (1983) has also noted a lack of correlation between regional plans and project planning at the local level in NSW.

Generally, the literature continues to call for regional planning approaches that will overcome the cumulative impacts of project-based development (Conacher 1994:359). It is being increasingly recognised that development proponents are often not specifically required to show how their project relates to the regional plan (Duffy 1983). Dale (1996) identifies this as a major problem commonly arising from deficiencies in the terms of reference set for statutory impact assessment. In general, regional planning processes have often failed to significantly influence the administrative and decision-making

processes of agencies with responsibilities for development approval.

An almost universal deficiency in regional plans reviewed in this document has been the lack of clear analysis of the decision-making structures and processes which will ultimately be responsible for implementing regional planning recommendations. While SEQ2001 did pay considerable attention to establishing a regional coordination council to oversee implementation, it did not adequately comprehend the nature of decision-making and administration within State agencies and local government. SEQ2001 perhaps could have played a major role in significantly reforming the way that decisions are made within the region, creating a far more suitable environment for implementation.

5.2.6 Is there enough integrated regional resource use planning?

The increasing academic and political calls for integrated regional planning outlined in chapter 2 suggest that the concept is still not well embedded as a significant management activity across Australia. As chapter 4 shows, however, these calls do not seem to reflect the high number of regional planning activities that have been completed in recent years or that are under way across Australia. This incongruence appears to arise from the 'undisciplined' or unisectoral approaches that have been applied to the vast majority of regional planning activities to date. Most regional planning activities identified by this review focused on regional conservation planning, regional forest assessment or regional economic development planning. There are still few fully integrated regional resource use planning activities. The RPAG-based activities in Queensland have made considerable progress in this respect, though they have focused more on establishing a balanced land use framework than on integrated social, economic and environmental strategies. The Victorian model is gradually evolving in a positive direction, despite its evolution from predominantly economic development roots.

The non-integrated or unisectoral/undisciplined nature of regional planning is a reflection of the character of the legislative and administrative arrangements which support it. Chapter 4 demonstrates that all States and the Commonwealth government have legislative and administrative arrangements in place which, in one way or another, encourage regional approaches to planning. As Conacher (1994:358) points out, however, overall policy planning for an *integrated* approach to the management of land, resources and the environment

has not been a significant feature. Regional environmental planning has flowed from environmental legislation and administration. Regional economic planning has flowed from Federal and State program-based support. Regional social planning has tended also to be focused on planning for social welfare administration.

5.2.7 Monitoring and impact assessment of planning

Regional planning approaches in Australia have often been established on a 'make or break' or an 'all or nothing' philosophy, sometimes resulting in spectacular failure. Regional planning projects have rarely been developed on an incremental basis, often resulting in 'mega-processes' with unclear planning objectives. Without a clear, self-reflective ethic underpinned by rigorous monitoring, regional planning in Australia is likely to remain inefficient and ineffective. The AAP again provides a classic illustration (Hayden 1996:190):

With hindsight, the pilot projects should have been restricted to a very small number and they should have been tested over several years. If this had been done with rigorous monitoring, we would have established much earlier that the concepts behind the program were deeply flawed.

Closely related to the lack of effective monitoring is the general failure of regional planning to subject its findings to any form of strategic impact assessment. In nearly all regional resource planning activities across Australia, there has been an implicit assumption that the social, economic and environmental assessments undertaken during the planning process are sufficient to ensure that negative impacts are avoided when plans are actually implemented. Impact assessment of either the policy or action content of plans is a rare practice, with proposed comprehensive regional assessment processes in the forest sector being a notable exception. It should be noted though that while social impact assessments have been a common feature of regional resource assessment processes in the forest sector, this tends to reflect that they have not been adequately built into the assessment processes leading particular land use change options being proposed. Social, economic and environmental assessment procedures need to be fully integrated in determining regional policy and land use proposals. No matter how good these assessment's are, however, there is still a need to undertake some form of impact assessment of these policies and proposals before implementation, and as a critical tool within the monitoring and evaluation process.

Applying impact assessment techniques before plan implementation and within monitoring and evaluation procedures allows for 'reality testing' before significant resources are committed or future land use zones are locked into place. The assessment work undertaken during plan development does not negate the need for at least a brief consideration of the plan's combined impacts. Failing to do so ignores the fact that assessments undertaken in the development of land use options are not used simultaneously to predict the actual impacts of these changes in a more holistic way. While a particular land use change scenario may appear rational in terms of the social, economic and environmental data at a spatial level, it may ignore broader impacts that could potentially arise from the change.

Cramer *et al.* (1980) identify a number of institutional barriers to the full integration of impact assessment considerations within regional planning in the US. Those of them that could equally be at work in the Australian context include: resource constraints often not allowing for the substantial modification of a nearly complete plan that contains elements which may result in significant impacts; and limitations in the social and environmental sciences such that few reliable predictions of impact can be generated under even ideal circumstances. These limitations reinforce the need to better integrate these issues within more iterative planning processes.

5.2.8 Other general procedural problems

In the Australian literature, a range of other deficiencies arising from procedural problems in regional planning has been identified, including:

- regional plans often being too general to make a meaningful difference in the way that land use decisions are made (Ingham 1985, cited by Conacher 1994:361; Moon 1995);
- the (particularly sectoral) policies in some regional plans are mutually contradictory (Ingham 1985, cited by Conacher 1994:361);
- line managers in charge of regional planning processes often consider the time frames are too long, resulting in out-of-date products once agencies are ready for implementation (Conacher 1994:361). Other line managers may seek to undertake regional planning within time frames too short to sufficiently consider all the relevant technical issues;
- resource use planning activities across Australia have largely failed to build upon the collective technical and procedural wisdom that has evolved

from both successful and failed approaches in Australia and overseas. There appears to be little analysis of regional planning literature and practice before the instigation of new regional resource use planning activities (eg. see Reddel forthcoming:31). This problem has been exacerbated by the fact that the literature assessing regional planning against agreed criteria is limited.

While there is not enough evidence to suggest that these deficiencies are symptomatic of regional planning activities across Australia, they need close attention when designing best practice arrangements for regional resource use planning procedures.

5.3 Participation in Stakeholder Groups Involved in Regional Planning

It is in this third key element that regional planning activities across Australia have been most deficient. In general, more effort has been invested in broad community consultation than in direct resourcing of stakeholder groups to establish participative mechanisms for their constituents. The CYPLUS project and some comprehensive regional assessment (CRA) processes have been among the few to experiment with participant funding. This again reflects the centralist focus of most regional planning activities. The following sections further explore the ability of regional planning in Australia to engage participants within stakeholder groups and in the general community.

5.3.1 Public involvement beyond stakeholder representatives

The primary focus of this review has been on the equitable involvement of stakeholders within regional negotiations and the participation of constituents in stakeholder group activities. This is not to say that the regional planning activities should not seek to engage the general community, particularly those not represented by identifiable stakeholder groups. From their Australia-wide evaluation of regional social infrastructure planning, Jones and Thornthwaite (1994:103) caution against entering into general public participation activities without a clear view of what it is to achieve and how to undertake it in an efficient and effective manner. They suggest that many 'experiments' in regional social development have sought to involve disadvantaged and marginalised groups, but most experienced great difficulty in achieving this.

Apart from some of the larger and more integrated processes examined in this review (eg. SEQ2001, the Kimberley Plan, etc.), beyond the specific role of identified stakeholder groups, more general approaches to participation of the general public have often been limited and ineffective in influencing planning outcomes (eg. see Ingham 1985). A range of stakeholders interviewed by Reddel (forthcoming:30), for example, suggested that the SEQ2001 outcomes (the RFGM) would not have been any different without the broad consultation process undertaken. The consultation was structured in a way that limited the community to responding to givens within policy papers developed by technical working groups and previously endorsed by RPAG.

These sorts of limitations have frequently been raised about other regional planning activities across the country, and in some cases, have been blamed for their collapse. Reddel (forthcoming:25), for example, suggests that several commentators consider that the Moreton Region Growth Study, a precursor to SEQ2001 and established under the Whitlam government in 1974, did not collapse only because of the incoming Fraser government's abolition of the Department of Urban and Regional Development. The greatest criticism of the study was that it did not have a mandate from the community sector, despite representation from three levels of government.

5.3.2 Participation within stakeholder groups

Reddel considers that while SEQ2001 was innovative in terms of stakeholder participation, one of its major failings was that there were few resources applied to establishing and maintaining the mandate of the constituencies within various sectors (eg. effort put in to keeping the collective position of groups strong). (Reddel, pers. comm. 11/7/96). In the FNQ2010 process, there were significant differences in support given to different sectors. The environment sector was under-resourced to both participate as representative stakeholders and to establish and maintain a mandate. On the other hand, considerable effort was invested in ensuring that the human services sector was well informed about the regional planning process and able to develop a social planning and human services sector strategy. The sector, however, had insufficient skills to negotiate significant concessions within the regional planning process.

Many of the study participants in Reddel's (forthcoming:26) evaluation of SEQ2001 considered that while stakeholder participation was broadly representative, there were significant limits to

constituent participation within stakeholders groups because of the lack of human and financial resources committed, the lack of an overall consultation plan and the lack of strong community sector infrastructure. This resulted in only a few community sector leaders becoming involved. A form of 'elite'-based decision making evolved, constraining groups such as the environment and non-government human services sectors from effectively participating in policy development. He considers that there was an assumption that the sector members on the RPAG would have the capacity to adequately represent the views of their sector, despite the lack of resources or infrastructure to consult and report back to their constituents

Where resources have been provided to stakeholder groups, equity problems within these groups have frequently emerged. While there is no direct evidence of this in regional planning, some lessons can be derived from Landcare and catchment management activities. Martin and Woodhill (1995:178), for example, point out that Australian Bureau of Agricultural and Resource Economics surveys have shown that, on average, Landcare participants have greater farm areas, higher farm capital, higher farm cash income and a higher return on capital than non-Landcare farmers. They suggest that this inequitable tendency of 'self-help' programs to 'select' certain groups as participants is well recognised in the community studies literature.

It is important to consider the impact of inequitable involvement of constituents within stakeholder groups in assessing the effectiveness of regional planning. It may be a significant factor. Martin and Woodhill (1995:173), for example, suggest that while government encouragement of local rural participation has been very successful, it has often had 'unintended' effects which favoured particular groups of farmers. As a result, they suggest that integrated regional approaches to planning need to increase the 'transparency' of decision-making within degrading rural environments.

5.4 Case Studies in Regional Resource Use Planning

The following case studies—the Cape York Peninsula Land Use Strategy, the Murray Darling Basin Commission and the CRA for forests in the South East Queensland region—explore further the foregoing general observations at the regional planning project level. A similar format is used for each case study, focusing on technical, negotiatory

and participatory elements, and the core regional planning principles.

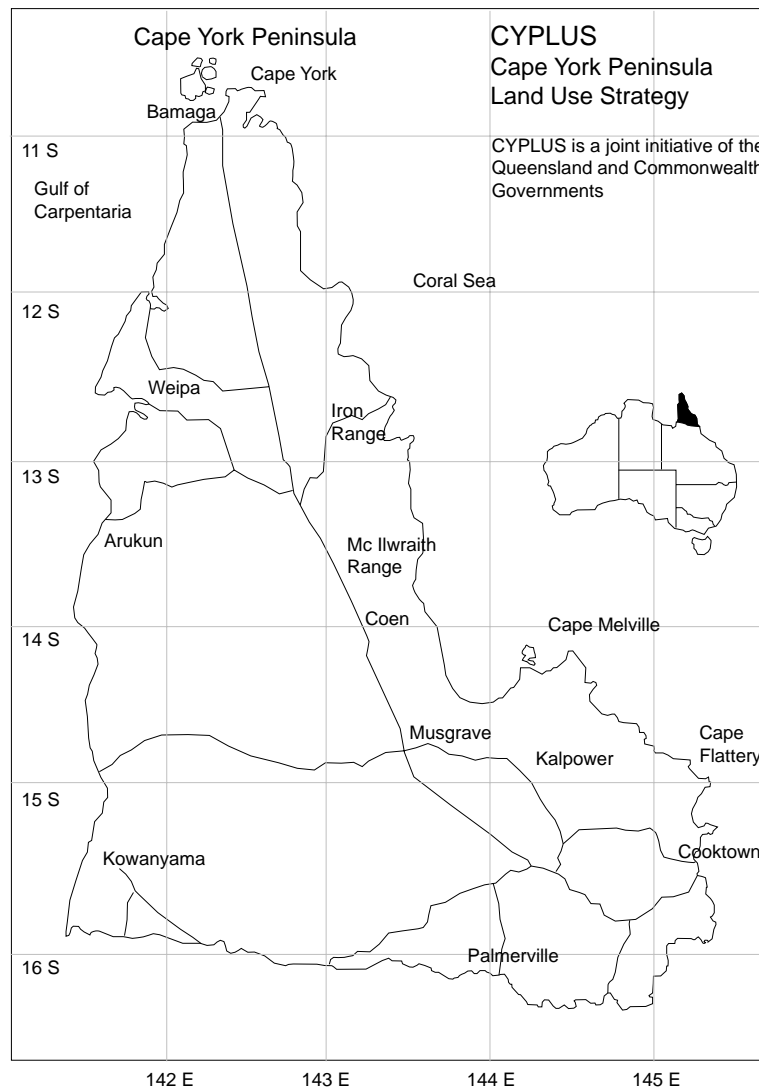
5.4.1 Cape York Peninsula Land Use Study (CYPLUS)

Cape York Peninsula's biophysical environment consists of monsoonal rainforests, heathlands, wetlands, savannah woodlands and 21 river systems, all relatively undeveloped because of their remoteness. The Peninsula is species rich and culturally diverse (see Map 2). Pastoralism and Aboriginal reserves are the dominant land uses. Over half the region's population is Aboriginal. The discovery by Comalco of bauxite at Weipa on the western Cape in the 1950s heralded significant mineral resource use pressures, followed by a significant decline in pastoral activities during the beef market slump of the 1970s. Since the 1980s, additional minerals development pressures, a re-emerging pastoral industry, rapidly increasing tourism, a space base proposal and the establishment of the airforce base at Weipa refocused national attention on the conservation and wilderness qualities of the Peninsula. The increasing capacity of Aboriginal communities to ensure their cultural, economic and land tenure aspirations are equitably dealt with has further created pressure for a regional approach to land use decision making (Howlett 1996:2–3).

During the late 1980s, a number of regional stakeholders, particularly Aboriginal and conservation interests, expressed the need for regional planning to address land use issues (Howlett 1996:36). These interests considered that Commonwealth involvement was essential to that planning, and as a result, a unique joint Commonwealth/Queensland government planning initiative evolved to address the resource use conflicts posed by a series of developments and trends (Howlett 1996:3).

CYPLUS was the result. Its aim was to "create a framework for making decisions about how to use and manage the resources of the region, incorporating the principles of ecological sustainability" (Howlett 1996:3). Howlett (1996:3) says that CYPLUS "reflected a desire for more cooperative approaches between the Commonwealth and the States concerning decision making in areas of significant social and environmental value."

Map 2. Map of CYPLUS study area. (Source: CYPLUS-on-line)



Before CYPLUS commenced, the Queensland Government resisted Commonwealth intervention in managing the evolving resource use conflicts on the Peninsula. The Ahern National Party Government proposed a broad, State-driven regional planning study to address these issues. In 1988 a firm of engineering consultants was engaged to compile a database on natural and other resources (Howlett 1996:45). While the Commonwealth initially offered support for this, it was not until the election of the Goss State Labor government that full commitment to a joint process was reached (Howlett 1996:45–6). By that time, the completed consultancy report had found that substantial gaps in the knowledge of natural resources on the Cape were “a serious constraint to

land use planning” (McNaught *et al.* 1994). This, together with the issues outlined above, led to the establishment of CYPLUS in its final form.

How the plan developed

It was intended that CYPLUS would include public participation in planning and decision-making. However, the proposal was always viewed by both the Commonwealth and State as a central planning activity, and consequently, it evolved a centralised organisational structure (Howlett 1996:iii). Several commentators suggest that other substantial limitations to the process existed from the early stages, including (Howlett 1996:46):

- the limited prior knowledge by government of the region, regional planning and Aboriginal land interests;
- the process was initially perceived as a resource inventory and much of the research activity was undertaken directly by government agencies.

A task force (support unit) was finally appointed in late 1992 to oversee CYPLUS, and the broad range of skills represented among the people appointed helped to allay fears. The task force members were considered to have the right expertise and experience to complete the task. However, Howlett (1996:83) notes that:

The jurisdiction over land and resource use is a contentious and unresolved issue between the States and the Commonwealth, the reality [being] that the States have tended to retain the...decision making power.

Indeed, the Queensland Government insisted that the task force be employed by, and report directly to, the Department of the Premier, Economic Development and Trade (Howlett 1996:46–7). This outcome became central to a number of critical problems faced by the CYPLUS task force as planning proceeded.

The establishment of institutional arrangements and procedures

Because CYPLUS was a joint initiative of the Queensland and Commonwealth governments, the funding was based on matching grants from each. Each project undertaken within the CYPLUS framework was to be directly funded by the appropriate Commonwealth or State body. The work was to be done in three stages (Howlett 1996:50):

- Stage I (1994); data collection, issues identification, analysis of opportunities and constraints for future land use;
- Stage II (1995); development of strategic directions for land and resource use in the form of principles, policies and mechanisms; and
- Stage III (1995–); strategy implementation, initially running concurrently with Stage II.

An Intergovernmental Steering Committee of State and Commonwealth representatives, was established in 1990 to coordinate the study and to establish the task force and its principles and procedures. The task force was to oversee the implementation of the CYPLUS programs (Howlett 1996:56). Overall management would rest with the steering committee; day-to-day management with the task force from its office in Cairns. The Queensland Government’s participation in the committee was to be coordinated

through an inter-departmental committee managed by Office of the Coordinator General, an agency “committed to the development of the state’s resources” (Howlett 1996:57). To oversee Stage I, the steering committee was later replaced by an inter-governmental management committee. This committee was co-chaired by the Commonwealth Department of the Environment, Sport and Territories and the Office of the Coordinator General. It also became a forum for policy discussion; recommending “operating principles and administrative arrangements for Stages II and III” (Howlett 1996:57–8).

During Stage I, the task force reported to the Office of the Coordinator General, based in Brisbane. Stage I cost \$7.65 million, shared dollar-for-dollar between the Queensland and Commonwealth governments (CYPLUS-on-line). Within Stage I there were two research programs: the Natural Resources Analysis Program (NRAP) and the Land Use Program. A public participation program involving residents, government, business and industry, and community groups was also established to facilitate community input into the two research programs (Howlett 1996:83). The public was to be involved from the start in deciding what data were needed in the NRAP, which would then go into the Land Use Program (Howlett 1996:50). Public input was also to be sought for the design of the program.

The Natural Resources Analysis Program

NRAP “was to collect and interpret base data on the natural resources of Cape York Peninsula” (Howlett 1996:51). Some 60% of the overall CYPLUS funding was allocated to this purpose and the information was stored in a GIS using ArcInfo as the operating system. Howlett (1996:51) suggests that, in total, the NRAP consisted of 19 research projects, as follows:

Vegetation Survey	Land Resource Survey
Terrestrial Fauna Survey	Mineral Resource Inventory
Bedrock Geological Data Digitising	Marine Plan Distribution
GIS Creation and Maintenance	GIS Development and Queensland Maintenance
Wetland Fauna Survey	Fish Fauna Survey
Environmental Region Analysis	Regolith Terrain Mapping
Coastal Environment Geoscience Survey	Airborne Geophysical Survey
Groundwater Investigation	Insect Fauna Survey

Flora Data and Fauna
Distribution

FINDAR System

Golden Shouldered Parrot
Conservation Management

Surface Water Resources

Fire

Feral and Pest Animals

Weeds

Conservation and Natural
Heritage Assessment

Conservation and National
Park Management

Land Degradation and Soil
Erosion

Population

Values Needs and
Aspirations

Service and Infrastructure

Transport Services and
Infrastructure

Economic Assessment

Traditional Activities

Secondary and Tertiary
Industries

Pastoral Industry

Mineral Resource
Potential/ Mining Industry

Forest Resources

Commercial and Non-
commercial Fisheries

Other Primary Industries

Tourism Industry

Indigenous Management of
Land and Sea

Current Land Use

Land Tenure

Current Administrative
Structures

A central aspect of NRAP and therefore the Land Use Program was the creation of a GIS database to support the collection, analysis and display of natural resource, social and economic data arising from Stage I (McNaught *et al* 1994:4). The processes followed in establishing the database as set out by McNaught *et al.* (1994:4–5) involved:

- a memorandum of understanding among participating agencies over the contribution and use of data to the GIS;
- access licences negotiated for “nominated CYPLUS participants”;
- a user’s manual produced and distributed to all NRAP and Land Use Program projects.

The CYPLUS GIS database was used for two main purposes in Stage I: (i) the evaluation of related information from the project (NRAP); and (ii) the use of data from project-to-project to create new data (Land Use Program) (McNaught *et al.* 1995:5). The database was to then be employed in Stage II to evaluate land use options and management strategies via an information system that would support users needs in long-term management regimes (McNaught *et al.* 1995:5).

The Land Use Program

The Land Use Program was approved in April 1994 by the inter-governmental management committee. The scope and objectives of the information studies were developed by cross-sectoral community and government working groups. These groups included Aboriginal and Torres Strait Islander people, graziers, conservation groups, shire councils, and other Peninsula residents. The objective was to encourage participation in information collection for land use planning in a grass-roots, community-based and cross-sectoral way (CYPLUS-on-line). The Land Use Program “was to collect information about economic, environmental, social and cultural issues related to the sustainable development of [the Cape]” (Howlett 1996:52). The research priorities were to be determined by community groups through the Public Participation Program. As a result, Howlett (1996:51) states that there eventually were 24 research projects undertaken within the Land Use Program, mostly by one-off consultancies. Topics of the projects were:

At the end of Stage I, a consultancy was also established outside the Land Use Program to explore the potential land use strategy models for CYPLUS (Focus and Campbell 1994). The object of the project was to investigate land use planning models that may have been applicable to the CYPLUS project, an activity that would have been better have been carried out at the start of CYPLUS. The report examined seven ‘models’ of land use planning and placed them within an ESD framework. The models examined were:

- the economic renewal model (*economically sustainable development*)
- catchment management models;
- regional planning models;
- the integrated regional environmental development planning model;
- performance based planning model;
- indigenous participation models; and
- community based management models (Focus and Campbell 1994).

The consultancy concluded that “...each model has pluses and minuses for its application to land use planning within the CYPLUS region. A combination

of aspects from several models will need to be adopted to provide for all issues raised...” (by stakeholders; Focus and Campbell 1994).

The Land Use Program was critical to future policy decisions in the CYPLUS process, and was to be controlled by working groups established through the Public Participation Program (Howlett 1996:71). The working groups, with the task force, would determine the terms of reference for reports, and would then collaborate with researchers over their findings (Howlett 1996:71). However, delays in the inter-governmental management committee approval of funding for projects for the Program left only six months for their completion. Consultants were employed directly by the Office of the Coordinator General, returning power to the hands of established bureaucratic structures. It was believed by many Public Participation Program participants that the delays would compromise community acceptance of the CYPLUS program (Howlett 1996:72).

Howlett (1996:73–5) demonstrates this by following the passage of one of the Land Use Program projects, showing some of the problems that arose from the Coordinator General’s central control over Stage I. The report’s accuracy was contested by members of interest groups within the relevant working group, and a meeting of interest group representatives was allowed to scrutinise the report. Finally, the Queensland government department responsible for that jurisdiction was allowed to exert substantial influence over the report’s fate. The report has yet to be published. These and other delays to the Land Use Program projects meant that many working groups had disbanded by the time the reports were finished. The reports proceeded, unseen by the task force or working groups, directly to the Office of the Coordinator General. This gave the Office “total discretionary power concerning the acceptance of these reports” (Howlett 1996:76).

The Public Participation Program

The Public Participation Program for Stage I of CYPLUS was initially regarded as “very progressive and received wide support despite early scepticism” (Roughly 1995:6). However, although it was recommended by consultants that the public should be involved in the “data collection, identification of communities and interest groups...[and] key issues in the study and design of the Program” (Craig, cited in Howlett 1996:53), the NRAP began without consultation. Public participation was facilitated through community group funding and was organised into three working groups—Nature, Land, People—and an ESD Coordinating Group to “coordinate

community and special interest groups” (Howlett 1996:54). An “Aboriginal and Islander Group” was established for cross-cultural communication and to ensure indigenous interests were accounted for (Howlett 1996:54). “The principles of the [Public Participation Program] were to be openness, accessibility and honesty” (Howlett 1996:54). Five community groups received funds to participate:

- Cape York Peninsula Development Association, including small business, primary industry and tourism;
- Cape York Peninsula Pastoral Advisory Group;
- Cape York Land Council, including a broad range of Aboriginal interests;
- Cairns and Far North Environment Centre; and
- Cook Shire Council, incorporating local government interests.

The Public Participation Program within Stage I used the “standard public participation tools; convening workshops and public meetings; attending community meetings; meetings with representative groups and individuals” (Howlett 1996:66). Working groups analysed land use issues and their criteria for sustainability, and draft reports were publicly reviewed. Total funding to the Program was one third that of the NRAP, reflecting the greater importance accorded to data than to public participation (Howlett 1996:68).

CYPLUS Stage II—from Centralised to Decentralised Control

At the end of Stage I, there were many data and empowered regional stakeholders, but no clear or equitable arrangements for the negotiation of policies and strategies. The new-found negotiating strength of the regional community fundamentally influenced the State’s acceptance of the need to form a community-based Cape York Regional Advisory Group (CYRAG) as the key forum for strategy development. The final CYRAG report notes (CYRAG 1997:10):

While CYPLUS is a joint initiative of the Commonwealth and Queensland governments, the development of the Strategy during Stage II has been directed by, and under the stewardship of, the CYRAG. The role of this broadly based stakeholder group has been to initiate, develop and finalise recommendations on the vision, policies, strategies and actions for the sustainable land use, and economic and social development of Cape York Peninsula.

CYRAG comprised members of 15 community-based stakeholder groups. Key Commonwealth and State agencies were ex-officio members only. A

small secretariat and management group and the State interdepartmental committee were maintained to support the process. During Stage II, CYRAG members formed smaller working groups to address specific issues. There was limited time and opportunity for detailed community consultation in the formation of the strategy. The draft was opened for public review when completed in October 1996.

Mobbs (1997:13) considers that the “wide range of strategies and proposals developed by the CYRAG perhaps reflects the difference in priorities between community and government”. The consensus-based strategy is much more focused on developing an integrated and equitable framework for future decision-making and on specific project priorities rather than a definitive structure plan. Mobbs (1997:13) noted, however, that “governments were also seeking some clear recommendations and directions from CYRAG on preferred land uses ...”. She states (Mobbs 1997:14) that:

Broadly speaking...CYRAG resisted government expectations and pressure to produce such an outcome, deferring these decision for Stage III. The Strategy recommends “a formal assessment of the significance of natural and cultural values at the regional, state, national and international level as well as the determination of management needs for their protection (CYRAG 1997:159)”. It is understood that such an assessment must underpin the framework developed for future decision making. The fact this assessment remains to be completed (after spending five years and over nine million dollars), was a concern raised by many participants and observers of the CYPLUS process.

The State and Federal governments recently finalised their response to the CYRAG Strategy. In the disbursement of the \$40 million allocated to the implementation of CYPLUS by the Commonwealth, priorities were largely set entirely by State and Federal government agencies, and focused on non controversial issues such as land purchases for conservation, property management planning and enhancing protected area infrastructure.

Assessing CYPLUS against regional planning principles

The start of the NRAP program before the Public Participation Program in Stage I engendered community suspicion about the CYPLUS project, and the data collected reflected bureaucratic perspectives of importance of information rather than the “values and beliefs of the residents...” (Howlett 1996:53). Reflecting on the GIS component of the project, McNaught *et al.* 1995:14) suggests that:

It was a clearly recognised weakness of CYPLUS Stage I that no user needs analysis was undertaken to clearly identify and specify data needs to support CYPLUS goals. This would have: (i) developed a clearly formulated set of information needs for CYPLUS; (ii) raised the awareness of stakeholders; (iii) identified users outside government agencies...Project proposals could then have been formed to be consistent with the defined user needs and not along the line of what agencies anticipated would be applicable.

Howlett (1996:53–4) suggests that this indicated that public participation in Stage I was to be circumscribed from the start and that data collection was viewed primarily as a technical matter. The planning process, couched in terms of public participation and decentralised planning, more resembled a synoptic approach (Howlett 1996:62). This treatment of NRAP made the implementation of a Public Participation Program a difficult task (Howlett 1996:65).

The relationship between the task force and the Office of the Coordinator General in Stage I has been described as both combative and difficult (Lane 1992). The bureaucratic imperatives of the Office, charged with State development, were incompatible with the decentralist approach of the task force (Howlett 1996:59). Although the working groups did not agree on final land uses, they did agree in their disappointment at the Office of the Coordinator General’s dominant role in determining CYPLUS processes (Howlett 1996:60).

The Stage I Public Participation Program was established by the task force in 1992 to ensure the participation of all stakeholders with an interest in the Cape, and to ensure their equitable representation for effective participation (Howlett 1996:65). Community groups, however, believed the State government was not committed to the idea of public participation, a view they considered was frequently reinforced by the State’s actions. Nevertheless, many community groups that had been empowered through public participation, strengthened their bargaining capacity and their ability to effect planning strategies. The effectiveness of the public participation program facilitated by the CYPLUS task force was “counteracted by a bureaucratic organisation that refused to relinquish decision making power” (Howlett 1996:70).

A demonstration of the focus on centralised control during Stage I was the announcement (before the 1995 Queensland election) of the Cape York Wilderness Zone by the then Premier, Wayne Goss. This was done without consultation with remaining CYPLUS staff, and at a time when a number of Stage

I Land Use Program reports had yet to be delivered. Howlett (1996:78) concludes that “the major land use decision to emanate from the CYPLUS project was based on data obtained through the NRAP project [not through the Land Use Program as was expected] and was used for matters of political expediency” (see also Roughley 1995:7). This decision led to considerable conflict, with the pastoral sector in particular considering that its initial scepticism of the CYPLUS process was well founded (Roughley 1995:7).

Despite the centralised nature of Stage I, the constrained Public Participation Program was extremely successful in empowering regional stakeholders to both communicate among themselves and to articulate their own views for the future for the region. Howlett (1996:81) notes that “...stakeholders had been sufficiently empowered by the bargaining process facilitated by CYPLUS (Stage I) that they circumvented CYPLUS in order to obtain their favoured land use outcomes for the Cape”. This was demonstrated by the acceptance of CYRAG as the primary planning group in the development of key strategies and policies in Stage I. Mobbs (1997) states that “...the problems in Stage I were probably instrumental in galvanising community groups to ‘take charge’ and pursue the community-driven approach of Stage II”. Concurrently, although beyond the State-driven confines of the CYPLUS process, problems with Stage I also provided a basis for the negotiation of the Cape York Peninsula Land Use Agreement between Aboriginal, pastoral and conservation interests. This agreement was rejected by the Borbidge Coalition government when it came to power in 1996.

Despite a community-based group undertaking multiparty negotiations in Stage II, the fundamental flaws with which the entire CYPLUS process was established meant that CYRAG had its own limitations. In particular, Mobbs (1997) says that significant problems for CYRAG were:

- perceptions that CYRAG representatives were not accountable to their constituency;
- the lack of time and resources available for consulting on the strategic options developed by CYRAG back at the grass-roots level; and
- the ex-officio role of government contributing to lack of government support and guidance during negotiations.

It was this last point which has the potential to most comprehensively undermine the future implementation of the CYRAG strategies. At this

point, it is entirely possible that the original stakeholders empowered by the CYPLUS/CYRAG process will have limited say in the allocation of Federal and State government resources and support for implementation.

5.4.2 Comprehensive regional assessments in Australian forests

The forest use debate

Native forest management has been a contentious and publicly divisive issue in Australia since the 1960s. With the possible exception of the Franklin Dam controversy in the early 1980s, few environmental issues have had the capacity to engender the level of public debate seen in relation to forest matters. Routley (1974), Watson (1990), and more recently Taylor (1994) describe the debate. Notable examples of the conflict can be drawn from most States. In Queensland, this includes the wet tropics and Fraser Island. In New South Wales, it includes the North East Forests, including Terrania Creek and Chaelundi State forests, and the South East Forests. In Victoria, East Gippsland (including the Errinundra Plateau) was a major dispute focus. Finally, the export woodchip debate has affected several States, including Tasmania and Western Australia.

Typically, the area or region at issue has included rainforest and moist closed eucalypt forests, usually in coastal areas. Only in recent times has there been any significant attention to the drier and generally more extensive forest and woodland communities which typify Australia’s rangelands. The issue is often cast as two dimensional—forest utilisation (frequently logging or woodchipping) versus forest preservation. In reality the issues are far more complex, involving questions of science, sociology, economics, management and public policy. Although they are integral to ecologically sustainable development, social considerations have often been overlooked or not well integrated into forest planning.

Forests are valued for a range of reasons. They are storehouses of biodiversity and protect environmental capital in the form of soils and watersheds. They have great recreational, aesthetic and spiritual appeal. They also provide basic resources—timber and, along with the non-forested landscape, mineral and extractive resources—and opportunities for industries such as grazing and apiculture. While the relative importance of native forests in wood production has diminished with the increasing availability of plantation-grown timber, native hardwood forests are likely to play an important role as a resource base for some time to come. Socially, forests are valued both vicariously

and, in a more utilitarian sense, as sources of raw materials on which mainly rural communities depend, directly or indirectly, for their livelihoods.

The forest debate is therefore characterised by competition. That competition has many aspects, including economics, science, traditions and deeply held values and beliefs. The competition is compounded by different levels of skill and ability amongst stakeholders to influence government planning, and further by tenure and property rights associated with forest areas. The vast majority are publicly owned or, as is the case with Queensland's rangelands, held under Crown leasehold.

Multidisciplinary planning and negotiation for forests—the CRA process

The Australian governments agreed through the signing of the National Forest Policy Statement in 1992 (Commonwealth of Australia, 1992) to establish a comprehensive forest assessment and planning process known as Comprehensive Regional Assessment (CRA). CRA, it was hoped, would bring some long-term resolution to the forest use debate. Under the Regional Forest Agreements (RFAs) that follow from CRA, areas of forests are set aside in formal or informal conservation reserves or otherwise protected through prescriptions to ensure the maintenance of forest biodiversity and other natural and cultural values. Through the RFA, processes are also put in place to ensure forests are managed in an ecologically sustainable manner. The third key outcome of the RFA then follows: the establishment of an environment where the forest industries and forest-dependent communities may plan with a sense of improved certainty, thereby encouraging, amongst other things, increased investment in value-added processing.

Other attempts at multidisciplinary planning in forests pre-date the development of CRAs. These include the Forest and Forest Industries Council of Tasmania. Sanderson (1992:182) considers the 1990 establishment of the Forest and Forest Industries Council of Tasmania to resolve a seemingly intractable State-wide forest management dispute as one of Australia's first multidisciplinary negotiation roundtables. This process did eventually strike trouble as constituents of the five Green Independents in Tasmania's parliament became dissatisfied with key elements of the resulting Forest Reform Plan. Nonetheless, many of the principles attempted in this negotiatory approach have been brought forward into contemporary CRA procedures. Another more localised model which can be cited is the Conondale Range Land Use Study (Queensland Department of

Forestry, 1992), where multidisciplinary forest assessment and highly participatory planning were used successfully to resolve a long-standing forest land-use conflict.

The RFAs themselves are agreements between the Commonwealth and State governments. They will stand for 20 years with provision for periodic review and will be supported by legislation. As Commonwealth statutory interests are factored into the CRA process, the Commonwealth for its part will not exercise certain of its statutory powers, for example over the export of forest products, over areas covered by RFAs.

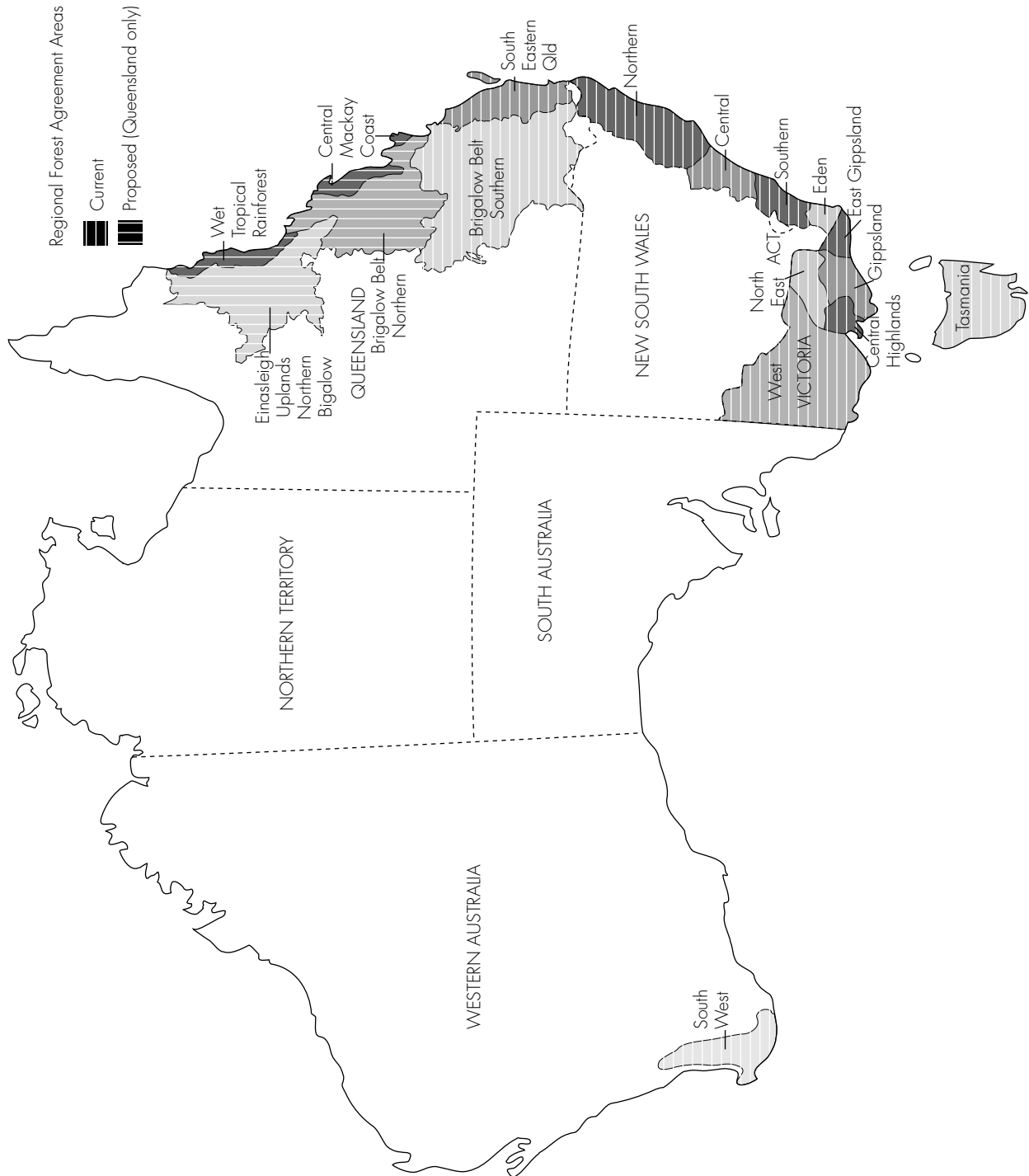
CRA processes are under way or have been completed in five Australian States: Queensland, Victoria, Tasmania, New South Wales and Western Australia. In Queensland, the process is currently being implemented over approximately 1.5 million hectares of predominantly publicly-owned forest in the south-east Queensland biogeographic region. The second priority covers the very extensive Southern Brigalow biogeographic region. These are the most important regions for the native forest timber industry in the State, accounting for approximately 80% of native timber log volume (cypress pine and hardwood). Other biogeographic regions are also identified as subject areas for the CRA process in the future. Map 3 illustrates the regions where CRA processes are currently under way, planned or recently completed throughout Australia.

An overview of the CRA/RFA planning process in Queensland

The planning processes used in the various participating States to develop RFAs vary according to circumstances, including previous reviews of the forest sector and stakeholder views. This case study focuses on the way in which CRAs are being implemented in Queensland, although in many respects the principles apply also to the process in other States. In general, however, the CRA/RFA process tends to be highly centralised, involving a Commonwealth/State Steering Committee, some mechanism for consultation with peak stakeholder bodies, and a series of technical committees which develop and implement assessment projects to fill gaps in existing data.

There are typically several distinct stages in developing an RFA. First is an assessment stage involving gathering of additional data on natural, cultural, economic and social values associated with forests where existing data are deficient.

Map 3. Regional forest agreement areas



Next, data are synthesised or integrated in preparation for the major stage of the process that involves the development and evaluation of forest land-use options. The final stage involves government-to-government negotiation to finalise the RFA. Key points to note are that the assessment stage involves gathering data on all aspects of forest conservation and use, including economic and social values, and that as far as possible in the planning phase, all values will be considered simultaneously. The planning process to be used at this stage in Queensland will be highly participatory and will be assisted through the use of planning support technologies (described below) as an aid to process transparency and equitable data accessibility. At least indicative data on social and economic opportunity costs, as well as potential gains, will be immediately available to planners and stakeholders alike as options are being developed. Periodically, or as feasible options start to emerge, more intensive and detailed processes of economic and social impact assessment will be implemented with some degree of direct community involvement.

One important issue for the planning stage of the process is the lack of generally accepted criteria for assessing social and economic values associated with forests, either as a means of limiting impacts or promoting social or economic objectives for forest industries or dependent communities. Although they have been surrounded by much controversy since their development in 1996, nationally agreed criteria do exist for the protection of forest biodiversity and cultural values (JANIS, 1996). These criteria establish some broad benchmarks for key conservation values—for example, inclusion of 15% of the pre-European representation of each forest community within the reserve system. While these criteria are not meant to be applied prescriptively and need to be interpreted in terms of their potential social and economic consequences, the lack of formal criteria for social and economic values nevertheless could be seen as placing those values on an unequal footing with respect to natural and cultural heritage values. One way of addressing this is to develop a set of objectives for economic and social as well as environmental and cultural values to guide the option development stage of the process. Such objectives will be developed with stakeholder involvement in Queensland and have been developed and applied in RFAs in other States.

Community involvement in CRA

The forests debate affects a broad cross-section of interests, either directly or indirectly. This includes various industry groups, conservation organisations, indigenous representative bodies, unions, local government and rural advocacy groups, in particular those representing small timber dependent communities. The broader community also has a general interest in the forest debate.

Given the significance of the issues and the range of stakeholders, it is imperative if consensus is to be built that the community has ample opportunity to participate in the CRA process and that negotiation between stakeholder groups is encouraged. Community involvement in CRA thus needs to be provided for at two broad levels. First, the procedures for developing CRAs need to provide for negotiation between stakeholder groups, through their representative bodies, in the process of developing forest land-use options. These issues are discussed below, under negotiatory and participatory aspects of the process. Second, procedures for community participation also need to provide for broad input, keeping communities informed of the progress of the CRA process and also, at the sub-regional level, to help identify areas of significance to communities.

Unfortunately, environmental stakeholders have chosen to withdraw in whole or part from the RFA processes in some other States. This may be interpreted as a signal of some fundamental inadequacy of process in those jurisdictions, or alternatively as strategic behaviour on the part of those stakeholders who may feel that their objectives can better be met outside the process. In either case it compromises the process as a mechanism for building public consensus and long term stability on the question of forest use.

In Queensland, all key stakeholders through their representative bodies, remain committed to and active participants in the CRA/RFA process. While negotiations on key issues are often protracted and arduous, their continued commitment to the process will result in more durable outcomes enjoying broad community support. Reasons which may be advanced for the continuing support of all stakeholders in Queensland are the commitment to openness and transparency of process, significant levels of State as well as Commonwealth resourcing for stakeholder participation, and a commitment to addressing issues on their scientific merit. These principles apply across all aspects of the process, as distinct from a more prescriptive approach based on the aforementioned 'nationally agreed' criteria.

Frameworks for negotiation

A number of institutional arrangements exist to support negotiation between stakeholders within the CRA process.

At the national level, the Commonwealth has established a National Forest Reference Group with membership drawn from key national stakeholders. The group will provide advice and feedback to Commonwealth Ministers on the implementation of key policies and strategies related to forest resources and forest industries. The National Reference Group also provides a forum for debate and negotiation between stakeholders at the national level. Examples of issues discussed within this forum include the previously described 'national criteria' for developing forest conservation reserves and general approaches proposed for implementing key stages of the process.

Queensland has established a Forest Reference Panel comprised of representatives of State peak industry bodies, conservation organisations, indigenous representative bodies, unions, local government and the Forest Protection Society representing the interests of rural communities. The Forest Working Group is convened to discuss a wide range of issues pertinent to CRA and other matters within the forest policy area and to assist in the preparation of advice to State Ministers. The Working Group forms the main negotiatory structure for CRA in Queensland. To date, this body has been able to develop agreed positions on many critical issues including the scope of the assessment process and the terms of interim forest management arrangements pending completion of the RFA. In the future it is expected that the reference panel will be closely involved in developing forest land use options, including negotiating trade-offs between environmental and socio-economic values.

Given the significance of the Working Group as a key negotiating forum, the effectiveness of the various State peak bodies to represent their regional and sub-regional constituencies and to maintain good two-way information flows at all levels becomes very important. In recent times in the Queensland process, it has become evident that the various peak representative bodies are having difficulties caucusing with their constituencies and maintaining effective two-way communication. The problem is made more difficult given the amount of information to be assimilated and assessed as the process approaches the completion of the assessment and data gathering phase, and the extremely tight time frames imposed by governments. The official completion

date for the first of the Queensland RFAs was set for June 1998, although December seems more realistic. Steps taken to improve the functioning of the reference panel include some adjustments to its membership, the provision of additional resourcing to representative bodies to assist their internal networking and an increased communications effort by State and Commonwealth governments, including co-funding of a communications officer with regional liaison responsibilities.

In response to specific issues and concerns raised by the indigenous representative bodies, the Queensland and Commonwealth governments have also recently agreed to the formation of an Indigenous Issues Working Group to specifically consider indigenous matters pertaining to the development and implementation of RFAs in Queensland.

Under the Queensland and some other State RFA processes, the Stakeholder Reference Panel also has representatives who sit on the Steering Committee. All stakeholders have the right to attend and participate in meetings of the various technical committees. Finalisation of the RFA, however, will be by government-to-government negotiation.

An interesting variation to the above pattern for community involvement and negotiation in the RFA process was applied in developing the recently completed Tasmanian RFA. In that situation, because of the reluctance of stakeholder bodies to work together 'across the table' in the process, the Tasmanian Public Land Use Commission (TPLUC, 1997) established a system of stakeholder mentors. The mentors consulted with assigned stakeholder organisations and brought those views forward to negotiations with the governments. By all accounts, and subject to the proviso that environmental stakeholders largely withdrew from the Tasmanian process, the PLUC model appears to have worked well in Tasmania.

The next most important mechanism for promoting negotiation among stakeholders is the land-use option development process itself. As previously discussed, social and economic values will, as far as possible, be incorporated at an early stage in planning. Stakeholders will participate in the development of environmental, economic and social objectives that will provide key reference points to the development of forest use options. Stakeholders will again be involved in the application and interpretation of those objectives through their participation in the planning phase of the process. A planning support tool, discussed below, will be an important facilitating mechanism at this stage. In addition to providing a

palette for the development of forest land use options, the capacity of information technologies to display environmental as well as economic and social information, and the interrelationship between these factors in real time, will be of significant benefit in promoting informed negotiation among stakeholders. The use of such information technologies is thus critical is presenting technical information to underpin negotiation in the option development phase.

A further mechanism for promoting negotiation and equity in the planning process has been the establishment of social assessment capacities by both the Commonwealth and Queensland governments. Queensland has a well established tradition of social assessment and impact assessment of major development proposals through agencies within the State Department of Families, Youth and Community Care. This resource is available as a support to the social assessment capabilities directly incorporated into the CRA/RFA structure in Queensland.

The Aboriginal community also has interests in the native forest estate. For the purposes of developing the south-east Queensland RFA, the three Native Title representative bodies appointed under the provisions of the Commonwealth Native Title Act each have seats on the RFA Stakeholder Reference Panel. In addition, the Steering Committee has recently agreed to the formation of a special Indigenous Issues Working Group to provide for further discussion on matters specifically related to indigenous interests in forests. Indigenous community representatives have also been involved in developing assessment projects which will compile data on indigenous cultural heritage values of forests. In the future, indigenous communities are also likely to have a direct involvement in management planning processes for the protection of places of cultural significance in State Forests, National Parks and other forested public land.

Participatory aspects of the CRA process

Given the breadth of interest, geographical size of the planning regions and levels of ability of stakeholders to participate in the CRA process, a range of participatory mechanisms is being employed. The most important of these is the previously mentioned Stakeholder Reference Panel. The make-up of the panel has been previously described. It includes representatives of all major stakeholder bodies and is independently chaired. A possible deficiency in the make up of this panel is lack of representation on behalf of recreational users of forests (campers, four-wheel-drive enthusiasts, bushwalkers and so on).

These interests are not covered by one or two peak representative bodies, and their inclusion in the reference panel has not yet been possible. Instead, provision will need to be made at later stages for comment on forest land use options by the recreation fraternity. The Steering Committee also considers requests for addition of new organisations to the panel from time to time.

Stakeholders represented on the reference panel can apply for Commonwealth and State funding to facilitate their participation. This covers not just the cost of attending meetings, but extends in some cases to engagement of consultants by stakeholder bodies to assist their participation, particularly in technical aspects of CRA. To further assist the transparency of the assessment and planning process and to provide for informed participation by stakeholders, government agencies are also making technical assessment data readily available to stakeholders, excepting commercial-in-confidence data and data which are culturally or otherwise sensitive. The assessment data will also be publicly available in a summarised form at the end of the assessment stage of the process.

Government officials have also conducted a series of public meetings through the south-east Queensland region. These meetings were intended more as information dissemination to the broader community in order to build awareness of the process and to respond to issues and concerns at the community level. There will be further follow-up public displays at key stages in the process, particularly at the completion of the data gathering stage and again at the end of the option development stage in order to present draft forest use options to the public. The latter stage will be followed by a formal period of public consultation during which written comments will be invited. Governments are also currently considering options for community involvement directly in the social and economic impact assessment processes, providing for a more in-depth level of public participation in the finalisation of forest land-use options over and above the opportunity to comment on the forest land-use options themselves.

Technical aspects of the planning process

The use of technical planning tools and information technology will play an important role in supporting the CRA process in Queensland, as is also the case in other States. With the number of information themes involved and the volume of data, technological planning tools will provide a means for storing, handling and presenting information for all facets of

the planning process, including community involvement and negotiation.

Technologies and tools employed will include spatial (Geographic Information Systems) and non-spatial databases. Expert knowledge will also be built in to display relationships between data themes so that, for example, the opportunity costs of allocating forest land to a conservation reserve can be indicated in real time. The planning support tool will also incorporate a module for allocating units of forest to potential alternative land uses and to periodically or progressively report on the level of satisfaction of objectives and criteria for the reserve system. In this way, planners and stakeholders can build up forest land-use options with a knowledge of the level of target achievement and, simultaneously, indicative social and economic opportunity costs. Alternatively, these planning technologies may be used to develop forest use options that seek to optimise across environmental, economic and social values. While similar planning tools have been developed for RFAs in other jurisdictions, a notable advance in Queensland's case is the improved level of reporting of social values, in particular the ability to model potential impacts of resource withdrawal and to link those affected communities with accepted indices of community sensitivity to change.

The planning support tool will also be compatible with systems used for estimating sustainable wood flows and with models for optimising the forest industries post RFA based on forest areas available for wood production and sustainable levels of supply for a range of values and products. Within this context, environmental modeling techniques have been usefully applied to provide an initial estimate of the pre-European distribution of forest communities (eg. the use of Environmental Domain Analysis). Modeling techniques could also play a useful role in enhancing biodiversity data, for example through the modeling of species or habitat distribution.

The use of these planning support technologies will provide an important tool within the CRA public participation and negotiatory processes. It will provide a palette for the development of forest use options, allow for periodic testing of the level of satisfaction against agreed planning criteria and targets, reveal indicative social and economic opportunity costs and provide a visual front end to the supporting data bases. In so doing it should promote an objective, iterative process for setting agreed forest land use options.

Summary and assessment of the CRA planning process in Queensland

The CRA/RFA process represents an attempt to apply a rational comprehensive planning model to address a long-term resource management and land use issue. The debate itself raises a complex set of issues covering conservation values, economics and social science while at the same time confronting strongly divergent and deeply held views. Under those circumstances, it is perhaps naive to believe that CRA/RFA will produce an outcome that will be supported by all players, or that the process itself will meet the needs of all players. Nevertheless, CRA/RFA does represent a significant attempt at tackling a complex and persistent problem with community involvement in the long-term best interest of the community and industry.

Given the foregoing description the following prospective assessment of the CRA process is provided, based on some of the key criteria for assessing regional planning processes:

1. The CRA process will promote equity in land-use decision-making by providing a variety of opportunities for stakeholder participation. Consultation and negotiation processes will be made more effective through resourcing of key stakeholder groups and through provision of information to allow effective and informed participation.
2. Efficiency in relation to a process such as CRA may be considered in relation to two sub-themes: efficiency in the gathering and use of information, and efficiency of the overall planning process in terms of effort expended and achievement or improvement of outcomes. In relation to the information theme, every effort will be made to use existing land resource, economic and social data wherever possible. Where additional assessment effort has been identified through gap analysis, the scoping of assessment projects has been guided by a consideration of how those data will contribute to desired project outcomes. Data efficiency considerations are thus in-built at an early stage and should minimise superfluous data collection. Efficiency is much harder to assess or to predict in the case of the overall process. With the complexity of issues involved, the diversity of opinions, and the desire to consult widely, the risk exists that processes may become bogged-down or unproductive unless a focus on outcomes is maintained and skilful process and project management practices are applied.

3. As a publicly funded process implemented by government, CRA is ultimately accountable through the action Ministers at State and Commonwealth level. Steering Committees are established between the Commonwealth and each of the States involved to guide the implementation of the CRA processes, including the approval of assessment projects, establishment of milestones, periodic reviews of progress and addressing any policy issues which arise. National and, in Queensland's case, State peak consultative mechanisms have also been established to provide regular inputs to the process and to assist in provision of policy advice to Ministers.
4. Integration of natural, cultural, economic and social values will be strongly emphasised throughout the CRA process. While formal criteria for the protection of forest biodiversity and other aspects of the natural and cultural environment will provide important guidelines for the development of land-use options, economic and social impacts, and means for mitigating those impacts will be fully integrated into the option development process. Economic and social assessments are proceeding in parallel with assessment of the natural and cultural values of forests, while the planning framework itself will promote an integrated approach.

5.4.3 Murray–Darling Basin Commission

The Murray–Darling Basin (MDB) covers much of south-eastern Australia and includes large areas of the country's prime farming and grazing country (MDBC 1995). Over 1.8 million people live in the catchment and a further million are 'heavily' dependent on its water resources. The MDB produces over 40% of the national agricultural output with a substantial flow-on to manufacturing. There is also significant mining and tourism activity and other water dependent industries. The MDB incorporates significant biodiversity, including both alpine and desert regions (MDBC 1995), but also has a number of serious problems. These include:—widespread dryland and irrigation salinity; increasing water pollution; increasing loss of indigenous flora and fauna, and blue–green algal blooms. These problems range across many State jurisdictions (MDBC 1995; ERIN 1995).

There is a significant history of inter-jurisdictional conflict associated with management of the MDB (Crabb 1991:148). Management processes within it (see Map 4) over the last 10 years, however, are demonstrating that planning and policy improvements are possible in complex systems

(McDonald 1992:216). Planning policies that seek to ensure conservation-based resource management have been effective tools in the Murray Darling because of their statutory basis (Jensen 1990:159). There have also been significant attempts to integrate technical, environmental and social policies into effective management strategies.

Historical context to the establishment of the planning framework

The historical difficulties concerning management of the MDB are well known. The natural catchment boundaries of the MDB are shared between NSW, Victoria, South Australia and Queensland, with the whole of the Murray in NSW. Doyle and Kellow (1995:221) suggest that intergovernmental relations between the first three States were underpinned by the formation of a treaty between NSW and Victoria in 1884 and by the threat by South Australia to appeal against legislation it perceived to be against their interests. Until 1992, when it joined the Murray–Darling Basin Agreement, Queensland was not involved at an intergovernmental level with management of the MDB.

The first formal agreement, the River Murray Waters Agreement (RMWA) was reached in 1915 with the passing of parallel legislation by each of the three States and the Commonwealth governing rights of access to water for navigation and irrigation, and establishing the River Murray Commission. The RMWA also provided for the construction of storage facilities, locks and weirs (Doyle and Kellow 1995:222). The RMWA was further amended in 1924 and 1934 to account for the decline of river navigation and a parallel increase in the use of irrigation.

The Snowy Mountains scheme, diverting the Snowy River into the MDB, precipitated the next 'round' of change in the inter-State relationships. The resultant conflicts over storage and water access extended the provisions of the RMWA to allow water sharing over the entire Murray and the Snowy's extra waters. Throughout these processes, South Australia was in constant conflict with NSW and Victoria (as the upstream States), and the Commonwealth Government (which relied on the more populous States for electoral success). The RMWA's sole management focus was on water quantity, not quality. As the problem of riverine salinity grew, quality became a major issue for Adelaide which relies on the Murray for its water supply (Doyle and Kellow 1995:223–4).

In 1985, the Murray–Darling Basin Commission (MDBC) and the Murray–Darling Basin Initiative were implemented, superseding the Murray River

Commission, with the three States and the Commonwealth reaching substantial agreement on the issue of saline water flows in the Murray–Darling. A number of deficiencies in the pre-existing management structure were identified, including:

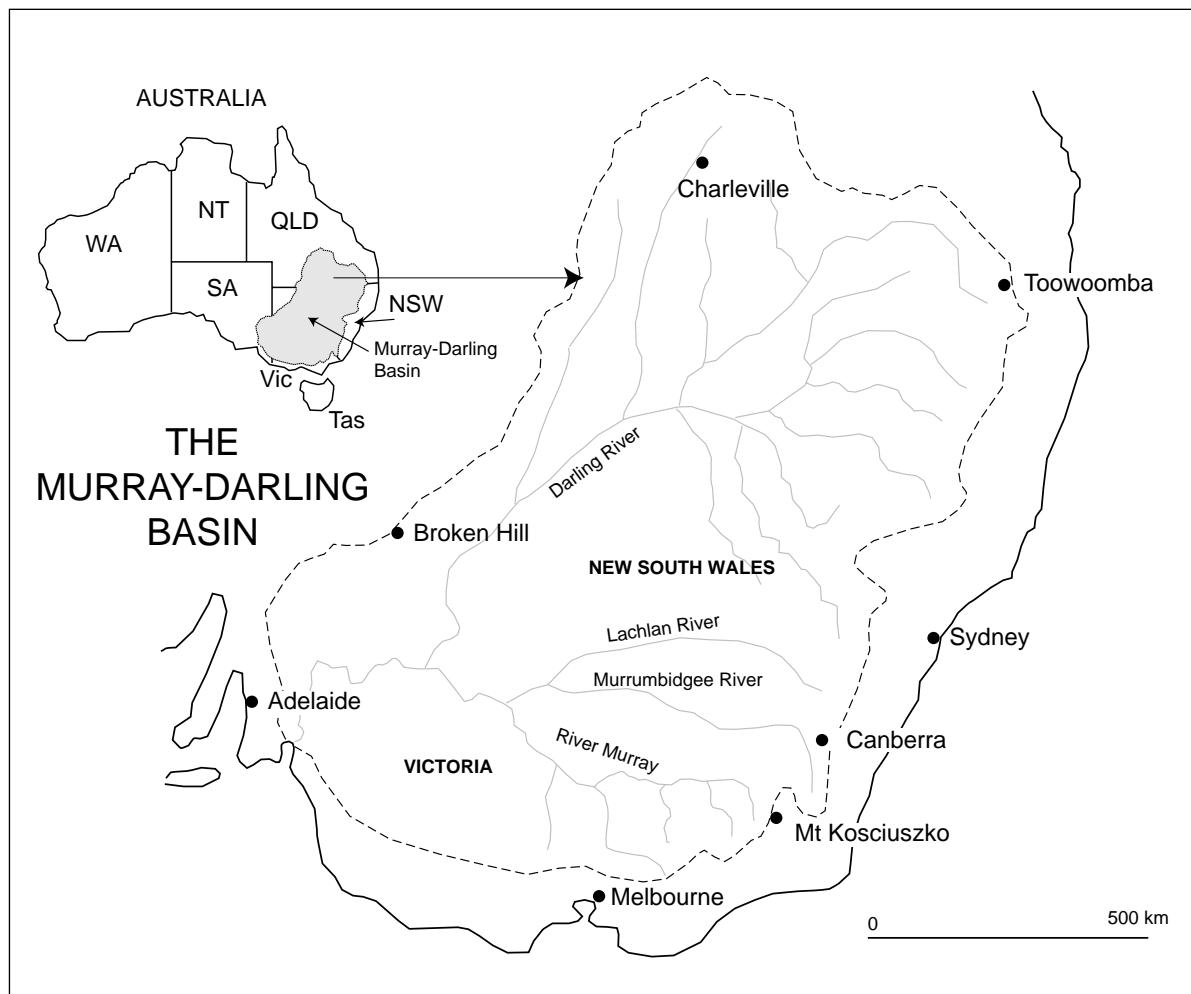
1. the lack of a single MDB-wide management agency;
2. the original commission could only make unenforceable management recommendations;
3. the RMWA required unanimity in decisions and could therefore be used to prevent recommendations coming from the commission;
4. the ability of the commission to influence land-use management and tributary management was limited;

5. management within States was divided between multiple agencies;
6. there were inadequate inter and intra-governmental coordination institutions, hindered by institutional complexity;
7. cost sharing arrangements were ineffective (Doyle and Kellow 1995:226–7).

Institutional arrangements and procedures

The MDBC was founded on three principles. The first was the need for sound administrative arrangements as a basis for political and technical approaches to river management. Second was the need for “mutually supportive management strategies”. The third was the need for a diverse level of community involvement (McDonald 1992:219). The final administrative structure and statutory duties for MDB

Map 4 The Murray–Darling Basin. (Source: <http://rubens.anu.edu.au/student.projects/wine/stats.html>)



management agreed to in the 1987 Murray–Darling Basin Agreement (MDBA) were set out as follows.

Day-to-day resource management would remain with the States. A Murray–Darling Basin Ministerial Council was established with membership comprised of up to three Ministers holding land, water and environment portfolios in each of the four governments involved. The Ministerial council would be serviced by the Murray–Darling Basin Standing Committee. A number of working groups were established to report to the Ministerial council. Queensland joined the council in 1992 after some years as an observer. The Murray–Darling Basin Commission (MDBC) now administers a range of programs on behalf of the Ministerial council relating to the management of the land, water and environmental resources. It also has responsibility for the management and distribution of the waters of the Murray River. The MDBC uses over twenty working groups with expertise in natural resource management to help integrate planning and management of the basin (MDBC 1995). The functions of the MDBC are to:

- advise the Ministerial council in relation to the planning, development and management of the water, land and other environmental resources of the MDB;
- assist the Ministerial council in developing measures for the equitable, efficient and sustainable use of such resources;
- coordinate and give effect to implementation of measures as directed by the Ministerial council;
- exercise the powers and discharge the duties conferred on it by the Murray–Darling Basin Agreement, or any Act approving the same.

The Murray–Darling Basin Community Advisory Committee has 21 community representatives from the four States, and representatives from the NFF, ACF, ALGA and the Australian Council of Trade Unions. A coordinated decision-making approach is being used between the wide range of organisations and groups. This involves “continuous consultation, high quality information flow between all relevant parties, rapid dissemination of research findings and a comprehensive and ongoing program of education...” (MDBC 1995). The committee was established to ensure the involvement of the MDB community “not in a tokenistic way” (Crabb 1991:152). Crabb (1991:152) suggests that the committee has a “difficult if not impossible task” in being a communication channel between the MDBC and the MDB community (see also McDonald 1992:221).

These difficulties arise because of the physical size and diversity of the MDB and the diversity within the community advisory committee. Another difficulty with the committee is its close ties to government, and a perception that it is a ‘top-down’ version of participation (Crabb 1991).

Crabb (1991:148) describes as difficult the process of moving the RMWA beyond being one of simply water allocation to consider also water quality. According to Crabb (1991:148), “no other major Australian resource has been subject to so many investigations, reports and recommendations, as well as so much inaction, particularly with respect to soil, surface and groundwater salinity problems.” Crabb (1991:149) has put this down to the difficulties of the institutional arrangements. The progress that was finally made would have been “unlikely without the involvement of politicians who were committed to the outcome” (Doyle and Kellow 1995:234, also Kellow 1992).

The MDBA also established a conflict resolution process between the governments involved, and put in place an environmental resources study (McDonald 1991:222), the Natural Resources Management Strategy and the Salinity and Drainage Strategy (Crabb 1991:147). These strategies lie within the context of the Murray–Darling Basin Initiative. The Salinity and Draining Strategy was the first attempt by the new management regime to deal with salinity in the MDB, particularly saline waterlogging in NSW and Victoria, and South Australian concerns over river salinity. It “provides the framework for coordinated management of salinity, land salinisation and waterlogging...” (ERIN 1995).

The Natural Resource Management Strategy was initiated in 1989 to encourage “interstate cooperation in investigations and the development of management programs...[through] a philosophical and organisational structure within which governments and communities can coordinate their work” (MDBC 1995). The MDBC believes that the approach “ensures community ownership of key elements of the strategy” (MDBC 1995). This is because the main tenure in the MDB is private land, requiring community input into planning, at both the advisory and implementation level (RAC 1993a:30).

The Natural Resource Management Strategy addresses biophysical, social and environment issues through two programs: Investigations and Education; and Integrated Catchment Management. The first program is used to help community and government organisations, such as CSIRO, universities and State

agencies to undertake knowledge-based activities with MDB-wide application (eg. applied research and community education). Program priorities are determined annually. The second program focuses on on-the-ground works. It should be noted, however, that the Murray–Darling Basin Initiative is also undertaking a long-term education program to raise community awareness and ability to respond to problems, the mapping of groundwater resources for strategic planning, and the preparation of management plans for discrete regions (RAC 1993a:32).

There are different approaches to sub-regional resource use planning of the MDB in the States (Jensen 1990:161–6). South Australia for example uses five ‘Valley Character Units’ (urban waterfront; recreation and tourism; irrigated agriculture; rural; and natural) to zone the river. NSW has used statutory planning powers, through Regional Environmental Plans (see chapter 3) to coordinate management at the local level.

Application of technical planning procedures and their integration

Before the Natural Resource Management Strategy was implemented, an Environmental Resources Study was established to identify sensitive environmental resources within the MDB, identifying the degradation of land and water, cultural heritage issues, etc. (RAC 1993a:27). The MDBC subsequently commissioned a number of research projects to inform the management of the MDB. One such project was the Murray–Darling Basin Project, which compiled, analysed and interpreted environmental information for the entire MDB. The project was undertaken in three stages. First, the availability of site-based data was determined and used for the second task of defining major ecosystems and relating those to the existing reserve systems. The third task then became to develop a strategic plan for the conservation of major ecosystems. The entire process was to be consultative (ERIN 1992a).

To undertake this, information on the location and nature of physical landscapes and associated processes was required. At some scales, these data have been compiled by State and Territory government agencies. At the time of the project there was no uniform coverage for Australia, so the CSIRO’s ‘Atlas of Soils’ was used (ERIN 1992b). The methodology involved the use of a computer-based reserve-selection tool developed by CSIRO.

One of the main advantages of this methodology is its flexibility. New solutions will be generated as new conservation goals or targets are defined, as new data

sets are added, or as different sets of constraints are imposed. Another advantage of flexible iterative procedures ... is that they result in efficient solutions, provided that the ... goals can be expressed as explicit rules and the required input data are available. (ERIN 1993)

A recent joint project between the Murray–Darling Basin Commission, the Murray–Darling Freshwater Research Centre and the Board of Studies NSW called *Waterlines* has produced a CD-ROM to provide information relating to irrigation and its associated water management practices in the Murray–Darling Basin (<http://www.opennet.net.au/partners/bos/waterlines.html>).

Assessing the planning process against regional resource planning elements and principles

General developments in management of the Murray–Darling Basin “provide an example of resource management for a large, diverse and economically, socially and ecologically very important region” with management involving cooperation by the Commonwealth, States, and communities within the Basin to resolve the problems of resource degradation (RAC 1993a:25).

The MDBA has perhaps made the most significant advances in improving the institutional environment for encouraging improved negotiation among key MDB stakeholders. Commenting on changes in the governance of the basin, Crabb (1991:151) suggests that since the establishment of the MDBA, the increased level of personal contact between stakeholders “has resulted in higher levels of knowledge, cooperation, trust and goodwill, all important in any negotiations.”

Most importantly, the institutional arrangements established have focused on promoting equity between the States. Blackmore (1995:18) considers that before significant cooperative action could be undertaken, two matters affecting the distribution of wealth between the States needed to be resolved. These were the distribution of water and the allocation of costs for salinity works. According to Blackmore (1995:19) the distribution of water was resolved largely with the completion of negotiations over the establishment of a continuous water accounting system in 1989. He considers the second issue was addressed through the negotiation of the Salinity and Drainage Strategy.

Despite these positive improvements, Doyle and Kellow (1995) make a number of criticisms of the Murray–Darling Basin institutional arrangements and structure. They consider that there remain significant intergovernmental problems because the MDB

transcends State boundaries. Further, once the focus of management shifted from water quantity to water quality, an enormous cultural shift was required among key resource management agencies. As a result of its legal basis, the MDBA 'locked' the States into far-reaching reform as a basis for effective change. This, however, has not been reflected in practice. Despite the important role communities and local governments have played in establishing the current management arrangements (RAC 1993a:26), in reality, the State-based approaches outlined illustrate the potential for centralised planning to override community input. Each of the States has, outside the MDBA framework, maintained traditional, rational planning methodology (Jensen 1990:163).

These more centralised approaches have not provided a structured way for governments to deliver an integrated Natural Resources Management strategy at the local and sub-regional level. The ACF considers that "the [Murray-Darling Basin Initiative] has been unable to deliver high quality results for the environment" due to: (i) the scale of degradation; (ii) the rate at which this is being compounded by current practice; and (iii) the lack of uniformity in government responses. More specifically, Blackmore (1995:22) considers that a failing with many of the

strategies has been that, "while they are able to articulate the right aspirations for the management of the resource, they are not able to deliver the product on the ground". Consequently, in the early 1990s, McDonald (1991:226) considered that an even closer link was needed between community actions and MDB management strategies. He considered that community groups required continuous support in both resources and strategic guidance.

In recognition of the critical link between community capacity and policy implementation, the Natural Resource Management Strategy is now increasing its focus on community leadership and participation in identifying and developing management solutions and implementing works programs. Some of these initiatives are outlined in Blackmore (1995:22). Wilcher (1995:209) also considers that the MDBA "has taken many steps toward placing normative principles of integrated management and strategies for their implementation in a statutory framework". Hence, at a policy level at least, the Murray-Darling Basin Agreement has stimulated integrated resource management in response to resource degradation (Wilcher 1995:209). The future appears to lie with improving community capacity to implement decisions and priorities.

6. Innovative Procedural and Analytical Techniques to Improve Regional Planning Outcomes

Significant scope exists for the application of improved procedural and analytical techniques in achieving more sustainable and equitable regional resource use outcomes. In this chapter, we review the potential application of a wide range of *innovative* techniques to regional planning in Australia's rangelands. These techniques include various forms of ecological, social and economic assessment. In a procedural sense, they include techniques for facilitating participation within stakeholder groups, and negotiations among stakeholders with an interest in land use outcomes. GIS and IT applications are considered in light of their potential application to both procedural and technical aspects of planning. Apart from reviewing 'state-of-the-art' procedural and analytical techniques that potentially can be applied to regional planning, we comment specifically upon how these techniques can be applied in Australian rangelands.

The techniques outlined below are listed because they provide options or tools for resource use planners and stakeholders involved in regional planning negotiations. They do not represent an exhaustive list of standard social, economic and environmental assessment tools, or the public involvement techniques that have traditionally been used as the mainstays of regional planning. Further information about traditional practice in these areas can be obtained from standard texts in resource planning and assessment, which are referred to from time to time..

The following procedures and techniques can be applied, modified or explored by the reader to add to the kitbag of tools they need to build better resource use planning processes at the regional level. To add value to this kitbag approach, Appendix 2 outlines examples from the regional planning literature of strategies that could be, or have been negotiated to address key regional issues. This appendix provides a

guide to the sorts of outcomes that could potentially arise from the application of best-practice techniques and procedures. There remain significant gaps, however, in the techniques and procedures needed to facilitate better regional planning. Chapter 7 identifies these gaps, and the R&D activities that should be given highest priority if we are to continue to improve regional resource use planning practice in Australian rangelands.

6.1 Improving Technical Capacity in Regional Resource Use Planning

Innovative techniques and approaches in regional resource use planning span ecological, social and economic disciplines. IT procedures, through their integrative power, also have the capacity to assist interpretation and analysis within all of these fields, and to facilitate negotiatory and participatory processes. The following discussion explores some of these innovations that may have application to regional resource use planning within rangelands.

6.1.1 Innovative IT techniques for regional resource use planning

Various innovative analytical techniques and approaches in artificial intelligence and other advanced information technologies that have evolved in recent years have the potential to help bridge the gaps between current deficiencies and best practice in regional planning (see section 5.1). They include IT support for: (i) revealing the diversity in stakeholder values, attitudes and preferences within regions; (ii) negotiation and mediation processes in the assessment of resource use options; and (iii) evaluating trade-offs that need to be negotiated between competing and conflicting resource uses and stakeholder values.

Collaborative and group decision-making tools

Collaborative decision-making tools use a combination of information technologies including the Internet, GIS, knowledge-based systems and modeling tools. They may also be applied within shared workspaces to provide a computing environment that facilitates decision-making processes for multiple decision-makers (Karacapilidis *et al.* 1995; Winograd 1994). One of the central ideas of the development of these tools is that users are able to access a shared workspace of some form (much like a whiteboard concept) where they can leave and/or edit documents, view spatial and other data, and have conferences with other decision-makers.

Several current research initiatives are demonstrating the value of collaborative decision-making tools in negotiating and mediating environmental and resource use planning and management. Examples include: (i) the Sustainable Telematics for Environmental Management Project (Cannel *et al.* 1996), which aims to improve stakeholder access to information and software to support sustainable land management decision-making; (ii) the GEOMED project (Gordon 1995), which aims to integrate advanced IT and networking services for creating and disseminating geographical information; and the SIROMed project (Cocks and Ive 1996), which is developing a computer-based spatial DSS to be used as a mediator between multiple groups and to identify areas of agreement and disagreement relating to the optimal use of different land units.

Computational dialectics is another IT initiative in support of collaborative work and group decision-making. This new area involves “the development of computer systems which mediate and regulate the flow of messages between agents in a distributed system so as to facilitate the recognition and achievement of common goals in a rational, effective and fair way” (Gordon, 1995). These systems can provide effective tools for facilitating negotiation and mediation. This method, is being used in, for example, the European Zeno project (Gordon 1995) which is developing a Web-based mediation system to facilitate group decision-making. It uses techniques such as shared work and meeting spaces to improve access to distributed and heterogeneous geographical information.

There appears to be considerable potential to implement these approaches within regional resource use planning to improve effectiveness and equity in information provision and thereby support collaborative work and group decision-making processes.

Knowledge-based and related approaches

Knowledge-based systems are used to organise and deliver knowledge (expert and non-expert) in a useful format. They are computer-based tools comprising: (i) a knowledge base containing a representation of knowledge on a particular problem (ie. domain knowledge); and (ii) strategies for solving problems using that knowledge (Schmoltdt and Rauscher 1996). A number of knowledge representation tools are available including rule-based, class-based, logic-based, case-based, and neural networks. Methods for encoding knowledge include databases (spatial and non-spatial), computer algorithms, hypertext, mathematical equations, and non-language sources such as pictures, sounds, and smells (Schmoltdt and Rauscher 1996). By applying heuristic knowledge to a symbolic representation of a problem, knowledge-based systems are able to answer ‘what if’ types of questions.

Other artificial intelligence techniques such as expert guided task analysis and problem definition (Walker *et al.* 1995; Lowes and Walker 1995) can also provide tools for definition and specification of planning problems. Expert navigation of policy and resource information may be assisted by linking expert tools with GIS and information bases of policy and stakeholder objectives. Graphical knowledge acquisition tools, such as graphics, hypertext links and rule languages which specify relationships may be used to facilitate knowledge acquisition for the development of these tools.

In regional resource use planning processes, the application of knowledge based systems and related techniques would allow for the representation of a much greater breadth of data and information, including local and expert knowledge and spatial and non-spatial data. These data could be effectively used within mediation and negotiation processes for regional resource use planning.

Explanation or argumentation schema

A significant issue in regional decision-making process is not so much the provision of information and modelling capabilities, but some form of explanation and justification for the outcomes of that process (Lowes and Walker 1995). Within a planning environment there is a need to support decisions made and arguments in relation to different options. Argumentation schemata provide a technique for modelling the explanation as an argument (Bench-Capon *et al.* 1991). They provide a structure for representing the components of an argument (ie. context, assumptions, backing information, inference rules, conclusions and exceptions) and for linking them in a convenient manner.

Within regional resource use planning processes, these approaches could be developed to provide for linkages between the important items in a policy, legislative or expert system framework in order to support mediation and negotiation processes.

Data and knowledge analysis tools

Data and knowledge analysis tools could potentially support complex multi-objective decision processes. Tools of this type have been developed using expert systems and other techniques to evaluate the consequences of policy and to identify potential conflicts. Policy rules may be represented in logic programs (Bench-Capon *et al.* 1991) and used to develop schemata of relationships between data, expert knowledge, legislation and outcomes.

Multi-agent and cooperative expert systems may be used to model resource use conflicts, and would be particularly useful given the multi-stakeholder objectives and potential conflicts in a resource planning environment. The linkage of these multiple expert systems with a spatial knowledge base permits evaluation of spatial impacts and modelling of location-specific conflicts and objectives during planning.

A number of learning techniques are useful for analysing data and knowledge bases. These include inductive learning, neural networks, and evolutionary algorithms. Logic has been used as a representation for policy and legislation in a number of applications to analyse, for example, implications and inconsistencies within the policy framework. Neural networks are a form of machine learning (or optimisation) which could be particularly useful when there are noisy and incomplete data sets. Genetic or evolutionary algorithms are another machine learning technique in which algorithms or models are allowed to cross-breed and mutate to develop improved algorithms. This latter technique may be used for developing improved plans and rule sets from existing sets of rules.

Case-based reasoning depends upon 'experience' stored in case studies. It is an IT technique that involves a form of pattern matching in order to achieve the best match of a situation with one of a number of cases. Case-based reasoning systems are therefore a form of expert knowledge that allows for new cases to be matched to previous cases; if a good fit is found then inferences are made about the new case. An example is a lawyer using past cases to determine legal precedents. Case-based reasoning could provide an effective technique in knowledge-based systems for policy and environmental

applications and as a basis for evaluating planning options.

User-orientated tool-kit approaches

As noted in chapter 5, regional resource use planning has not taken full advantage of the opportunities provided by spatial analytical tools and modelling capabilities linked to GIS. Aspinall (1994) suggests that this is because: (i) tools for data management are better developed than those for spatial analysis; (ii) ecological research has focused on ecological processes and functioning rather than the analysis of spatial phenomena; and (iii) interest in change in patterns and processes at regional, national or global geographic scales has grown only in recent times.

There are, however, opportunities to address this deficiency through recent IT advances. For example, the use of a toolbox approach (Aspinall 1994) or a toolkit environment for the creation of customised decision-support tools (Walker and Johnson 1995) has been advocated to provide a generic set of spatial analysis methods for the investigation of spatial data. The principles of these approaches are that they should properly address issues of scale and the management of data quality and error propagation (Aspinall 1994). They should also provide for developing or customising decision-support tools by the user from a set of core resources (Walker and Johnson 1995).

Toolkit approaches should provide "a flexible system, giving decision support commensurate with the current state of understanding at a range of scales" (Walker and Johnson 1995). One being developed by Walker and Johnson (1995) will enable users to link external resources including GIS, simulation models, knowledge bases and inference mechanisms, to provide an environment that can be customised to address particular tasks. They argue that this user-orientated approach should enhance the operational use of the DSS product for spatial analysis by a range of potential users with varying skills levels.

An integrated systems approach

An integrated systems approach to IT development that couples a number of technologies will allow for a range of heterogeneous data and knowledge to be accessed, integrated and used. It will take advantage of the spatial, temporal, and other analytical strengths of the alternative technologies (Coulson *et al.* 1987; Loh and Rykiel 1992; Lowes and Bellamy 1994; Bellamy *et al.* 1996). An integrated system would therefore be characterised by 'methodological pluralism' with individual components of the system being based on different concepts, levels of

aggregation, and methods of analysis (Fedra 1994). As Fedra (1994:287) states:

The challenge is in merging the respective paradigms to create a new field of integrated environmental information systems, that goes beyond interactive models, GIS, and expert systems.

An effective integrated system, however, needs a suitable integrating paradigm. The artificial intelligence technique of object orientation provides the ability to model real world features with corresponding knowledge-base and software objects. It has been shown to provide a powerful and intuitive method for representing and integrating knowledge and data, process models, and spatial information (Fedra 1994; Lowes and Bellamy 1994; Bellamy *et al.* 1996). In addition, it allows for the encapsulation and abstraction of different levels of information and functionality. Through the integration of appropriate methodological tools, object-orientated methods potentially provide for the development of efficient, flexible, and easy to use IT innovations.

An integrated system would offer several advantages to resource use managers and planners (eg. see Loh and Rykiel 1992; Bellamy *et al.* 1996): (i) all relevant planning and management information would be synthesised in the one place; (ii) it would provide a vehicle for analysis, communication, learning and experimentation to a group of users with diverse, including non-technical, backgrounds; (iii) it would allow for the incorporation of ecological, economic, social and cultural considerations in the decision-making process; (iv) a large number of options could be considered with the same intensity; and (v) the decision- support process is documentable, repeatable and consistent.

Approaches to information and R&D delivery

'Distributed systems' and 'prototyping' are two methodologies used in information systems development which can take account of the collaborative and integrative requirements of decision support for the regional resource use planning process .

Distributed systems is an information systems development that involves linking users in many locations. It can cope with these users having varying computing resources and technical capabilities, a range of data and other information resources available for collaborative use, and different information needs. This approach can involve the use of a number of information technologies such as collaborative and group decision-making tools described earlier in this section.

Prototyping is another information systems development approach in which a number of system prototypes are developed through the life of the project. These prototypes include some of the components and functionality of the final system. Their purpose is to give the users a feel for development of the system and to provide a focus for discussion and further elicitation of requirements. Prototyping "can be understood as an experimental, adaptive and highly interactive approach to software engineering" (Fedra 1994):

The most important aspect of rapid prototyping ... is its role in shaping and in many cases even making possible a realistic and efficient dialogue between the system's developers and users. It is a mechanism for the learning process of the user and the analyst or developer, and this learning aspect ... requires a common language of the prototype as an efficient communication tool. (Fedra 1994:228)

Prototyping approaches are iterative and incremental. They are appropriate where exact user requirements cannot clearly be defined *a priori*, and are likely to evolve over time. They are also appropriate where there is a need for experimentation and learning by users and developers before commitment to the development of a final system (Alavi 1984; Bellamy and Lowes 1995).

6.1.2 Innovative environmental assessment and management methods and techniques

Ecosystem management approaches emphasise making choices based on public concerns about ecosystem health, cumulative effects, and the long-term sustainability of ecological relationships. This contrasts the traditional regional planning goals of maximising the productivity of any one resource use (Cortner and Moote 1994). In principle, ecosystem management:

...focuses on the ecological conditions necessary to maintain resource productivity, and examines resource interactions over broad spatial and temporal scales. Because of its experimental nature, ecosystem management places considerable emphasis on identifying indicators of ecosystem health and monitoring and evaluating conditions as they change through time...It also stresses the need for adaptable institutions that can readily adjust to feedback and changing social goals and objectives (Wallace *et al.* 1995: 35)

Environment Canada (1995) visualised relationships within ecosystems as three interlocking circles: environment, economy and the community. Traditionally, most decision-making has separated

these three components with little understanding or recognition of, for example, the effects of economic decisions on community needs or the environment. An ecosystem approach, however, requires an equal and integrated consideration of each of these components. The challenge for decision-making on regional ecosystem management planning is firstly to understand the links between these components and secondly to redress the imbalance among them (Environment Canada 1995).

There are a number of innovative environmental assessment techniques and procedures with potential to provide support for ecosystem management approaches in regional resource use planning, and which may also help bridge the gaps between current deficiencies and best practice. Some of these approaches are discussed below. They include a framework for implementing planning processes, as well as several analytical techniques that could support ecosystem management approaches to regional resource use planning in rangelands.

Bioregional planning

Bioregional planning has been proposed as a mechanism and framework for achieving the key Commonwealth government goal of protecting biological diversity and maintaining ecological processes and systems (eg. Sattler 1993; Lambert *et al.* 1996):

A bioregional framework enables the appreciation of the inherent ecosystem diversity to be conserved within each broad geographic unit that responds to a particular set of environmental determinants; it enables the use of a scale that is practical in terms of nature conservation and land use planning; and it enables recognition of the main threats to biodiversity on a regional basis and of possible interrelationships with other land management issues. (Sattler 1993:314)

A recent study has recommended the development and implementation of a model bioregional planning process that could be adapted to a wide range of bioregions and community situations (Lambert *et al.* 1996). Lambert *et al.* (1996) proposed that this model process include:

1. Identification of the bioregion, based on appropriate natural boundaries
2. Identification of the biodiversity to be protected within a "community of interest"
3. Identification of the threats to the biodiversity that is to be protected within the "community of interest"
4. Expert advice being sought on the best means of combating the threats
5. Community agreement on a vision for the future of biodiversity in the region and the best strategies to combat the threats to the vision
6. Incorporation of strategies into ongoing activities and existing planning processes
7. Ongoing monitoring and reporting.

There has been growing recognition in Australia of the need for not only a national reserve system for the conservation of biodiversity but also for better management and protection of remnant native vegetation within a landscape used for rural production (eg. Campbell 1995). This objective would be a key component of any bioregional planning, but the focus on protection of biodiversity needs to be integrated within a broader multi-objective regional planning process.

Ecological risk assessment

Environmental risk analysis considers "the risks to human health, welfare and ecosystems that result from adverse developmental impacts on the natural environment" (Beer and Ziolkowski 1996). Risk assessment involves building risk analysis into a framework that allows the identification and characterisation of potential adverse effects of exposure to environmental hazards.

In practice, there are many forms of risk assessment. Environmental impact assessment processes commonly undertaken in Australia, for example, are essentially a form of risk assessment. Ecological risk assessment, however, is a more recent activity that has been defined (Beer and Ziolkowski 1996:27) as:

... a process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more adverse stressors. A stressor includes any chemical, physical or biological entity that can induce adverse effects on individuals, populations, communities, and ecosystems.

Hunsaker *et al.* (1990) distinguish between regional risk assessment and local risk assessment. They consider that the general theoretical framework is the same for each; both involving hazard definition and problem solving phases. They also identified important issues for regional ecological risk assessment. These included the definition of the disturbance scenario, the assessment of boundary conditions, and the spatial heterogeneity of the landscape. There are, however, a number of common problems in implementing regional ecological risk assessment. These include that: (i) ecosystem properties are still poorly understood at regional scale; (ii) regional models of ecological processes are difficult to validate; (iii) spatial and temporal

biological data available for large geographic areas are inadequate; and (iv) little is known about the influence of aggregating or integrating dissimilar data on uncertainty in model parameters (Hunsaker *et al.* 1990).

Indicators of sustainability

The pragmatic indicator, or threshold-based approaches of environmental reporting frameworks, such as the pressure–state–response (PSR) model (see Chapter 5), promote a simplistic view of the interactions of human and natural systems. They imply a linear relationship between human activities and the environment that would appear to be in conflict with adaptive ecosystem approaches that embrace the complexity, non-linearity, and catastrophic dynamics of the interaction of natural and human systems (see Chapter 3.).

Current ecological research has recognised that there are major technical limitations in the available ecological paradigms, theories and techniques (eg. Gunderson *et al.* 1995; Norton and Nix 1996). Science has limited capacity to identify and predict the causal relationships and ecological significance of many situations, with many problems appearing intractable in the short to medium term, and others perhaps being insoluble (eg. Functowicz and Ravetz 1990; Dovers 1996). This is leading to a fundamental shift in focus towards identifying and recognising risks and uncertainty in environmental management as an input to the planning process (eg. see Norton and Nix 1996). The key to this approach is the communication of an understanding of ecosystem health and integrity, and the development of a shared meaning of risks. It depends on recognising the diversity of values relating to natural resource use systems and the need for stakeholders to negotiate consensus about tolerable risk (Gunderson *et al.* 1995; Handmer 1996).

Strategic environmental assessment

Formal environmental impact assessment, as currently administered in Australia, is project specific and reactive. It lacks a proper ability to quantify cumulative, regional and long-term impacts, and to evaluate development proposals within a regional context (Court *et al.* 1994:v–vi).

Accounting for ESD requires changing from a reactive to a proactive approach to environmental impact assessment whereby ecological and economic considerations are integrated into decision-making, and in which alternatives need to be considered in terms of efficiency, equity and sustainability criteria with short and long term effects.

‘Strategic environmental assessment’, incorporating ‘cumulative impact assessment’ is now being proposed as one of the principal institutional tools for implementing ESD (Therivel 1993):

Cumulative impact assessment takes account of the environmental impacts of actions which are individually acceptable, but may be cumulatively unacceptable because of time and space crowding, synergisms, indirect effects and “nibbling”. Strategic Environmental Assessment takes account of the environmental impacts of policies, plans and programs in contrast to individual projects...There is general agreement that cumulative impact assessment is best accomplished within an strategic environmental assessment framework (Court *et al.* 1994: i–ii).

Strategic environmental assessment can be defined as “the formalised, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan or program and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in publicly accountable decision making” (Therivel *et al.* 1992). In a review of existing implementations of strategic environmental assessment, however, Glasson *et al.* (1994) identified that it was fraught with a number of technical and procedural problems. Technical problems included: analytical complexity; limited predictive capacity due to unavailability, or inappropriateness, of data; the complications of the requirements for public participation; and the lack of a body of guiding principles for implementation. Procedural problems related to: the fact that policies, plans and programs were often nebulous, evolve in an incremental fashion, do not have clear boundaries and often overlap each other; and the tendency for decision-makers to weigh up the environmental implications of resultant impacts in the wider context of their own interest.

Strategic environmental assessment is in an early stage of development in Australia. By integrating environmental goals and principles into high-level decision-making, however, its practical application has the potential to ensure that policymaking accounts for sustainability principles (Court *et al.* 1994).

Assessing land capability and suitability

Land capability assessment is a means of assessing the inherent limits of discrete units of land to various uses and managerial practices (Conacher 1994–95). The focus on resource limitations and ways to resolve them distinguishes the approach from land suitability evaluation.

The most commonly used internationally accepted methods for assessing the potential of land for one or

more uses are based on the standard guidelines of the Food and Agriculture Framework for Land Evaluation (FAO 1976). This approach is particularly appropriate for regional planning (Conacher 1994–95). The framework provides a set of methodological guidelines rather than a classification system for evaluating particular areas of land in terms of their suitability for specific land uses. One of the key principles of the approach is that land suitability refers to use on a sustained basis with reference to the physical, economic and social context of the area under investigation. The suitability for land uses is, however, generally assessed in terms of on-site biophysical criteria only, and important socio-economic factors, land use interactions and off-site implications are often not considered.

In response to these deficiencies, a ‘framework for evaluating sustainable land management’ has been proposed (Smyth and Dumanski 1993). The framework focuses on evaluating the sustainability of existing land management and current land uses at the farm level. In this framework, sustainability is a measure of the extent to which a defined land use in a specific location and over a stated period of time is expected to meet five requirements: (i) productivity (ie. the maintenance or enhancement of production or services); (ii) security, or at least a reduction in the level of risk in production; (iii) protection of the natural resource and prevention of degradation; (iv) economic viability; and (v) social acceptability (Smyth and Dumanski 1993).

In Queensland, the framework is being used to monitor on-farm sustainability to assess improvements in sustainability brought about by best management practices. At the farm scale, a farming system is considered to be sustainable if it continues to satisfy the needs of the resource user and does not degrade the resource base. One of its main limitations is that it tends to be a reactive rather than a proactive approach to sustainability assessment. Other weaknesses are its focus on on-site factors, its approach to the classification of sustainability within defined time frames, its lack of a multiscaled approach to sustainability assessment, its focus on existing land uses and its inability to deal with multiple land uses and land use interactions.

6.1.3 Innovative regional social planning and assessment techniques

At the regional level, social planning and assessment has traditionally focused on welfare and community-based service delivery agencies undertaking broad need assessments and determining the basic human services required. Determining human service needs

has often relied on the simple application of human service delivery benchmarks against the statistical demography of the community (eg. see Briggs 1992). While these approaches have often been driven by the needs of government agencies seeking to deliver program funds, they have, nevertheless, frequently been highly participatory. They have rarely, however, been well integrated into land and resource use planning exercises and have often failed to focus on broader, non-service orientated aspects of social need.

Menzies (1993), SAULT (1995), Honey and Briggs (1996) and Menzies *et al.* (1996) have developed a detailed set of guidelines for carrying out social planning activities, particularly at the local government level. While Menzies *et al.* (1996) focus of the community development processes which underpin social planning activities, Honey and Briggs (1996) and SAULT (1995) focus on technical innovations in planning for the delivery of a wide range of human services. In a progression beyond social planning techniques, Jones and Thornthwaite (1994) review how some of these techniques have worked in practice at the regional level.

In contrast to human services planning, cultural heritage assessment techniques have often been well integrated into land use planning processes, but have frequently been based on limited participation. They have tended to rely on the technical survey and assessment techniques of archaeological or architectural experts, rather than involving communities in identifying and managing places and landscapes that they consider to be of regional cultural and social significance. Grogan *et al.* (1991) and (QDFYCC 1996b) provide a range of techniques and procedures that can be applied to overcoming some of these problems in cultural heritage planning at the regional level.

The following sections outline some innovative social planning and cultural heritage assessment techniques that have been or could be applied to improve the outcomes of regional resource use planning.

Social impact assessment

Social impact assessment can add significant value to regional resource use planning processes. In Australia, however, social impact assessment has been applied mainly as a predictive tool within impact assessment processes established under Commonwealth and State statutes (Dale 1997). Unfortunately, it has rarely been applied (eg. as a component of strategic environmental assessment) as a tool to refine proposed policies or plans, and to help ensure that potentially harmful social and cultural

impacts are identified, averted or mitigated. In regional planning in Australia, there are few well documented examples of social impact assessment being applied either to refine entire draft regional plans or key initiatives arising from the planning process (eg. proposals to restructure one industry or sub-region).

Taylor *et al.* (1990) define social assessment as anticipating and describing the social effects of change, so that they can be managed as early as possible. They also stress the need to involve all groups so as to manage the benefits and costs of change in a process of social development. Ideally, it should be a proactive rather than a reactive process. The SIAU (1994:8) consider social impact assessment to be a specific form of social assessment that potentially can be applied to policies, plans and development proposals alike. Social impact assessment processes tend to rely on the typical impact assessment procedures of defining the proposal, understanding the social environment, predicting potentially harmful impacts, designing strategies to avoid or mitigate these impacts, and monitoring and responding to these impacts and the effectiveness of management strategies put into place (see SIAU 1996:3). Because of the nature of social problems, it relies both on quantitative and qualitative social data. It also relies on an understanding of the values and aspirations of various interest groups to enable it to identify and manage impacts.

Traditionally, social impact assessment has been applied as a technical tool to assist centralised decision-makers take land or resource use decisions. In keeping with more recent developments in planning theory, however, many authors are increasingly seeking to apply social impact assessment as a framework for empowering different interests within communities to participate effectively in the highly political arena of resource development decision-making (Craig 1990; Dale and Lane 1994). Application of social impact assessment in this framework has the potential to allow disempowered interests a more effective role in centralised decision-making or, indeed, to facilitate access of these interests to the negotiation table.

In the context of regional resource use, social impact assessment has tended to be applied to identify the impacts of radical restructure of regional industries arising from national or State resource use inquiries or resource assessments. This has particularly been the case in the forest sector (eg. see SRCU 1993; Manidis Roberts 1996). Its application, however, has tended to be after the major decisions have been

made, rather than as part of the assessment processes used to determine options for land use change. This relegates social impact assessment to ‘mopping up’ the impacts of significant land use change rather than being more centrally used in empowering affected communities and interest groups to negotiate more equitable land use outcomes. This is recognised in the US under the *National Environmental Protection Act*, where the mandate for social impact assessment has been broadened from administrative decisions to include urban and regional plans, even if the plans consist of general policies rather than lists of projects (see Cramer *et al.* 1980:63).

Indigenous land interest models

Land use planning and impact assessment processes in Australia have traditionally dealt with indigenous cultural interests in land from a narrow, technical perspective, but it is equally important for assessment techniques and procedures to “acknowledge that indigenous interests are not limited to cultural heritage” (QDFYCC 1996b). Failure to recognise these broader interests can result in conflict during regional planning and subsequent development approval processes. As a result, the Social Impact Assessment Unit within the Queensland Government has proposed the adoption of an ‘indigenous land interest model’ within land use planning and assessment processes. The model seeks to protect the cultural and intellectual property of indigenous people and provide a stronger framework and more equitable environment for negotiations over resource development. The model provides a better structure for integrating social, economic and cultural impact assessments.

The basic elements of the approach include: (i) proponent or planning agency funding being provided under contract to indigenous organisations for carrying out agreed research and assessment work programs; (ii) *a priori* negotiation of research and assessment work programs; (iii) control of the appointment of technical experts in ways that suit proponents, planning agencies, indigenous groups and competition policy; (iv) retention of culturally sensitive information by indigenous groups; and finally (v) a framework for facilitating direct negotiation between planners, development proponents and indigenous groups over land and natural resource use (see QDFYCC 1996b:10).

6.1.4 Innovative economic assessment techniques

Section 3.2.4 outlined the theoretical themes in the economic literature of relevance to resource use

planning. The following innovative techniques, by and large, reflect these themes.

Property adjustment pressure/viability

Much of the early writing on viability prospects appeared in the late 1960s–mid 1970s in response to emerging structural problems in broadacre livestock and cereal industries, and the intensive livestock and horticultural industries (eg. see Vincent 1976; Standen and Musgrave 1969; McKay 1967). To a lesser extent, severe market problems in the wool and grain-growing sectors in the late 1980s also saw a re-emergence of interest in this area, as did the issue of providing infrastructure in isolated rangeland communities (eg. see Paul *et al.* 1986; Musgrave 1986; Lloyd 1987).

Several sub-themes apply to this literature which relate to: (i) the nature and scope of the small enterprise problem and need for macro-adjustment (eg. see Tweeten 1967; Standen and Musgrave 1969); (ii) efficiency issues including economies of size and productivity potential (eg. see Watson 1967; Vlastuin *et al.* 1982; Stefanou and Madden 1988); (iii) welfare issues including relativity of farm income to welfare standards and access to alternative income sources (eg. see Robinson and McMahon 1980; Quiggan and Blastuin 1983; Males *et al.* 1987); (iv) risk and income stability associated with size (eg. Corra *et al.* 1982; Anderson and Bruyn 1978; Barry *et al.* 1988); (v) solvency and debt servicing capability (eg. Skees and Reid 1984; Shepard and Collins 1982; Griffis 1989); (vi) influence on resource condition (Noble *et al.* 1980; Passmore and Brown 1992; Slee and Walker 1994); and (vii) land tenure and its effect on adjustment prospects (Armstrong and Lawson 1990; Young *et al.* 1986; Robertson 1987).

Regional/industry adjustment pressure/viability

The initiation of a substantive literature on regional implications of rural adjustment pressures and viability prospects for individual enterprises largely coincides with that of the above. Following some early reviews of failed war service settlement schemes (eg. Hawkins and Watson 1972), a significant addition to the regional viability literature occurred in the early to mid 1970s with a vigorous public debate and scrutiny of then existing institutional arrangements for adjustment under the Commonwealth Rural Reconstruction Scheme (eg. Dickinson 1977; IAC 1976). At this time, several other sector specific schemes with direct regional implications such as the Marginal Dairy Farm Reconstruction Scheme and Fruitgrowing Reconstruction Scheme were also implemented or reviewed (IAC 1976).

Some additional work in this field appears to have emerged locally in response to a government inquiry into the financial state of pastoral leases in the Western Division of NSW (Hassall and Associates 1982), the severe nationwide drought of the early 1980s (Powell and Saeed 1984; Gregory 1984) and from North America during the so-called ‘farm crisis’ of that time (Nuckton *et al.* 1982; Ginder *et al.* 1985). In some senses it is hard to differentiate between the regional and industry sectoral sub-themes on viability, as both carry strong regional resource use and welfare implications. The main discriminating feature would seem to lie in the regional work more specifically accounting for impacts of rural adjustment that affect other industrial sectors and individuals not employed in rangeland production but otherwise resident within the affected regions (eg. Stayner and Reeves 1990; Stayner 1990; Sorenson 1990). This work places some emphasis on regional input–output analytical techniques and various forms of social impact assessment. Otherwise, the impacts are largely qualitative and/or anecdotal.

Natural resource economic theory and practice

Following some pioneering work in the 1960s (eg. Hardin 1968) the economic literature dealing with managing natural resources and environmental goods and services emerged strongly in the early to middle 1970s (eg. Stoevener and Shulstad 1975; Solow 1974; Seneca and Taussig 1974). Much of this literature coincided with a raised public awareness over the seeming finite availability of some industrial resources and the over-exploitation of otherwise renewable resources, as well as the increasing spectre of environmental pollution. It also coincided with the rapid development of natural resource economics as an undergraduate and postgraduate course topic in many universities around the world (Cannegieter 1964; Barde and Pearce 1991).

Topics typically canvassed included: (i) environmental externalities (eg. Whitby and Hanley 1986; Steiner *et al.* 1995); (ii) resource scarcity in the context of population and economic growth (Barbier 1989; Barnett and Morse 1963); (iii) intertemporal considerations for optimal resource exploitation (Kennedy 1987); (iv) public goods and common property resource exploitation (Izac 1986; Tisdell 1991); and (v) property rights issues (Quiggan 1988; Larson and Bromley 1990). These topics are closely interrelated, dealing with different types of externalities and their causes, effects, prevention or accommodation. To a lesser extent, the early literature also canvassed theoretical and practical issues relating to capital budgeting techniques and the valuation problems then being encountered in

bringing non-market elements of resource use decision problems into formal cost benefit analysis. These are treated separately in the following two subsections.

Cost–benefit analysis

Capital budgeting techniques or cost–benefit analysis (CBA) have evolved largely since the Second World War, as a consistent method to assist both private and public decision-making for projects whose outlays and returns accrue over time. The early use of CBA in a regional context was largely confined to infrastructure decisions such as siting airports, motorways, reservoirs and other public utilities (eg. power stations; Layard 1974; Prest and Turvey 1965). The techniques have been progressively refined and in the 1970s and 1980s were increasingly applied to environmental issues such as recreational amenity in forests and water bodies, abatement of noise and water pollution and land degradation (eg. Tisdell 1991; RAC 1992b; MacLeod 1993a). One of the limitations of applying CBA techniques at the regional level is that economic effects at that level depend on non-additive flows of money through various sectors.

CBA, in one form or another, however, is now perhaps the most widely used (or recognised) method for assessing the potential economic payoff attributed to a given resource allocation decision. In essence, CBA attempts to identify all of the costs and benefits associated with a given allocation decision and to systematically compare them (Pearce 1991). To the extent that many land use decision contexts involve both outlays (or sacrifices) and benefits accruing over time, the systematic comparison is traditionally made in conjunction with *discounting* procedures (Chisholm and Dillon 1971).

Valuation of environmental values and impacts

A major limitation of CBA as a tool to promote economic efficiency and welfare is the difficulty of determining the value of environmental impacts which are typically unpriced within competitive (or realistic) markets and weighting the welfare outcome inherent in any distribution of benefits and costs between stakeholders. For this reason, valuation has preoccupied the resource and welfare economics profession for much the same length of time that the environmental economics and CBA literature has been evolving (eg. Young 1992; Winpenny 1991; Willis and Corkindale 1995).

The literature on valuation is extensive and growing (see MacLeod 1996). What is evident from the literature is the controversial nature of the field in general and of some valuation methodologies (eg.

contingent valuation) in particular. As a sub-theme, valuation issues have not yet peaked in their historical development, with the literature extending near-continuously from the 1960s through to the present. There is, however, a definite waxing and waning of interest in some specific methodologies (eg. travel cost proxy methods versus contingent valuation).

Because realistic valuation of costs and benefits is central to sound resource use planning and to understanding potentially disparate valuations placed on resource use by different stakeholders, this subsection is intentionally more detailed. Moreover, the basic calculus and analytics of economic allocation methods (such as CBA and mathematical programming) are relatively straightforward once the difficult estimates of relative values of potential resource uses have been elicited. The treatment commences with an acknowledgment of existing work in valuation, a typology of values, a classification of methods, and brief statements on the relative strengths and weaknesses of the various approaches.

In the past 25 years a number of detailed texts have been published on the economic evaluation of environmental resources (eg. Hundloe 1990; Tietenburg 1992; Krutilla and Fischer 1976). More recently, four particularly comprehensive reviews have been conducted of resource evaluation methods and their specific application to environmental cases within Australia (Department of Finance 1991; DEST 1995b; NSW EPA 1993; Young 1991).

A range of techniques has been developed and refined within economics to address the issue of placing some kind of value on otherwise non-priced environmental resources (see Table 7). In seeking to place economic values on these resources, several kinds of value have come to be recognised that carry different implications for valuation and decision-making, as well as present some unique quantification problems. These include, *use* values and *non-use* values. The latter non-use values include *option* values, *quasi-option* values, *existence* values, *vicarious* values, and *bequest* values (eg. Chisholm 1987b).

The relevance of each type of value to any particular economic evaluation task would depend on the specific resource use decision context associated with the task. As a general rule, however, the level of difficulty associated with quantifying these values increases exponentially from use values to bequest values. Not surprisingly, the non-use values are rarely incorporated into practical assessments of resource use. Nevertheless, the non-use values do represent benefits or welfare gains and so each would ideally be

considered in any economic analysis. *Social value* has recently been identified as a potential type of value (Johnston 1994). Social value embraces the qualities for which a place or thing has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group. This encompasses items or places that have aesthetic, scientific or social significance or other special value for future generations as well as the present community.

Two of the major literature reviews on the economic valuation of environmental impacts (DEST 1995b; NSW EPA 1993) presented the prevailing techniques within classification frameworks that were very similar. These essentially divide the techniques into three categories: market (value)-based techniques; surrogate market-based techniques; and simulated (eg. survey) market techniques. The logic underpinning each of these categories relates to the economic recognition of *benefits* reflecting either an individual's or society's *willingness to pay* for something, and *costs* being measured as *opportunity costs*. For most goods and services there are real markets from which such measures can be directly observed. As such, where formal markets exist for the goods or services, price and cost data are taken directly from them to estimate changes in their value to individuals or society.

Where no direct market exists for the environmental goods or services, the following range of valuation techniques seek to obtain cost and revenue data from 'related' (or surrogate) markets. These relate to the effects of the change in quantity, quality or other attributes of the goods and services on other observable surrogates. The values then depend on how closely the surrogates are related to the environmental goods and services of direct interest.

- *Travel cost*—assesses the value of an environmental resource in terms of the willingness of individuals or groups to incur expenditure to visit or utilise it (eg. fuel, vehicle wear and tear, accommodation, meals, recreational equipment);
- *Hedonic pricing*—(also called *property value*, *wage-differential*, *land price* approaches) assesses the value of an environmental resource in terms of differences observed in prices paid for other goods and services that are affected by the presence or various attributes of the resource (eg. property and land value changes as a result of declining or improving vistas);
- *Proxy-goods*—(also called the *close substitute* approach) seeks to infer a value through the

market value of other goods or services which are close substitutes of the environmental resource of interest (eg. the cost of access to public swimming pools and construction of private swimming pools as a proxy for the value of recreational benefits from rivers and lakes).

When the desired cost or benefit values are not directly available from any formal or surrogate market, as is necessary to apply the valuation approaches detailed above, a third general category of approach might be pursued that involves an array of survey techniques intended to simulate market preferences. These include the following:

- *Contingent valuation*—attempts to estimate the value of environmental goods and services through direct questioning of an individual's or group's 'willingness to pay' for those goods or services or required compensation for their loss;
- *Trade-off games*—establishes trade-offs between hypothetical options, one of which is set in terms of money to establish a benchmark. Changes in the level of an environmental effect can then be gauged against changes in income or some other monetary baseline (eg. is loss of a sensitive habitat worth more than \$X million?);
- *Contingent ranking*—employs direct questioning about preferences between environmental goods and services and other goods and services, one or more of which have a set monetary value (eg. does the value of access to a wild river exceed \$X million?);
- *Expert valuation*—(also includes *delphi* techniques) essentially relies on the estimates provided by so-called 'experts'. *Delphi* techniques are an iterative method of questioning and ranking, with feedback provided on each iteration in order to rapidly converge on a consensus value;
- *Priority evaluation techniques*—attempt to more closely mimic a realistic market choice context by offering hypothetical choices between combinations of goods and services (including the environmental goods and services) to be selected within the constraint of a fixed budget. Values are inferred from the selections that are made;
- *Choice modelling techniques*—have apparent similarities to other *revealed preference* approaches (eg. hedonic pricing) and *stated preference* approaches (eg. contingent valuation) and seek to elicit values through iterative questioning processes involving selections from combinations of hypothetical goods (including the

Table 7. Categories of values applicable to environmental goods and services

Concept	Definition
Use values	These values relate to utility of advantage reaped from the present exploitation or enjoyment of a resource. They can also relate to the increased utility or advantage flowing from an improvement in the quality of an environmental good or service.
Quasi values	Like use values, these option values relate to the potential value of the environmental good or service in another use rather than the present actual use.
Quasi-option values	Are a related concept to option values and are the benefits from deferring present use in anticipation of improved knowledge emerging on the environment to better inform a deferred decision. This is particularly pertinent for irreversible losses and cases where new technology or knowledge might enhance the value of the resource.
Existence values	These are the so-called non-use values that are independent of actual (use) or potential (option) values. These simply acknowledge that a given resource (eg. bilbies) exists and this alone provides benefits or value to some individuals or groups within the community.
Vicarious values	Somewhat like existence values, these relate to the benefits enjoyed from the indirect consumption of an environmental resource through reading or access to other media (eg. television, cinema, etc.).
Bequest values	These are the benefits that one generation might obtain from the knowledge that it is conserving a resource for the use or further conservation by another generation.
Source: MacLeod (1989:6).	

environmental good of direct interest) whose attributes differ in some systematic fashion.

Statistical relationships are identified between the attribute levels and apparent willingness to pay for them.

Each of valuation techniques described carries certain strengths and weaknesses in its application to regional assessment, and none seems to be universally superior to the others. The valuation context and the particular characteristics or attributes of the resources involved will largely determine the utility of any of the approaches, as will their data requirements, availability and acquisition tasks (eg. see Sinden and Worrall 1979).

At the most general level, the main strength of all of the valuation techniques detailed lies in their attempt to provide values to make the decision-making process more complete, transparent and rational. Whether this presumption is actually accepted or useful, particularly by non-economists, remains an open question. The application of economics to complex social and environmental problems is by no means an exact science. Moreover, the tasks involved in breaking the dimensions of such problems down to specific monetary values, even under simplistic assumptions, are often less than straightforward, and the ethical and philosophical dimensions of

exploiting environmental resources frequently go unresolved. Perhaps the most compelling case for seeking to place economic valuations on environmental resource use and/or quantifying trade-offs between production and conservation values is the pragmatic one of ensuring that they are at least included in the decision process.

A major weakness of the various approaches, beyond issues of completeness and so on, lies in their apparent lack of credibility with many decision-makers. For example, many economists have doubts that even the more theoretically sound and widely used valuation techniques such as contingent valuation can actually provide accurate and reliable values (eg. see Willis and Foster 1983; Knetsch and Sinden 1987; Knetsch 1993).

Multi-sectoral economic models applied at the regional level

Multi-sectoral models vary in sophistication from fairly simple representations of regional economic structure to large-scale simulation models with many policy and other variables and complex mathematical functions connecting them. The economic variables incorporated in the models are based only on market transactions and do not include broader community economic values such as existence, bequest, option and quasi-option values (Preece *et al.* 1995:45).

An application of potential importance to regional planning is their use to make baseline assessments of the current dependence of the economy on particular industries at the regional, State or national levels. They also can potentially be used to explore inter-dependencies between industries in terms of total employment, turnover and income. Other applications include the prediction of impacts of changes in the level and structure of particular industries, based on scenarios of future forecasts and trends. Finally, simulation results can be used to formulate regional development strategies with a focus on opportunities for expansion, requirements for infrastructure investment, labour demands, fiscal implications for State and local government, and facilitation of cross-industry cooperation (Preece *et al.* 1995:45). Preece *et al.* (1995:46) outline issues regarding application of such methods in strategic planning for eco-tourism development on a bio-regional basis.

It is possible, however, for environmental values to be built into regional multi-sectoral models. Driml (1987), for example, has applied multi-sectoral modelling to assess the economic impacts of tourism at the regional scale in respect to the Great Barrier Reef. Similar studies are currently being undertaken for the NSW Natural Resource Audit Council for the north-eastern region of the State, assessing the structural significance of activities in the region associated with public lands (see Preece *et al.* 1995:45). Knapman *et al.* (1991), also applied a particular multi-sectoral model to assess the economic impacts of tourism in Kakadu National Park on the Northern Territory economy.

Land and water resource degradation

There is an extensive economic literature (Australian and international) on issues relating to the degradation of land, water and other environmental attributes (eg. noise, air pollution, congestion). This literature, however, is often difficult to differentiate from valuation techniques, as the respective references commonly highlight the application of a particular valuation technique(s) within the context of a problem case example (eg. soil erosion, air quality, salinisation). The economic literature is replete with examples of estimation methods that have sought applicable cases rather than the other way around. Like much of the natural resource economics literature, this sector of the literature has focused heavily on agricultural applications and provided limited direct attention to specific rangeland resource management issues. However, as in the other areas of resource management, the scope for analogy,

principle sharing and methodology extension is quite strong.

Four sub-themes are described below: animal grazing; soil erosion/landscape degradation; water resource quality/wetlands etc.; and air quality/pollution (see MacLeod 1996).

There appears to be a near universal belief amongst rangelands research and administration personnel, conservation interests, many urban dwellers and, to a lesser extent pastoralists themselves, that overgrazing is endemic and *the* major cause of land degradation-induced losses (eg. see MacLeod 1992, 1993, 1995). There is, however, little support for this assertion in the economics literature, though there is little to refute it either).

Treatments of livestock grazing economic impacts (especially those based on field experiments) are commonly limited in scope and realism in the context of commercial grazing enterprises. Feedbacks of grazing pressure through resource condition to subsequent animal productivity are rarely incorporated and the unit of analysis most frequently applied is simplified to a standard animal (per head) or a grazed pasture (per hectare). Paradoxically, this abstraction from the complex context of commercial-scale grazing enterprises is usually justified on the grounds of aiding generality across enterprises. However, the abstraction itself merely serves to guarantee that the results rarely can be usefully applied to that very context for which such information is badly needed to improve resource use decision-making. Whole enterprise modelling and property case studies might improve on this (Pope and McBryde 1984).

Grazing-induced spillovers are recognised (eg. soil movement, siltation, destruction of riparian vegetation and corridors) as being important to catchment and regional resource health. Nevertheless, at the economic level, they do not seem to have been addressed. Despite some very early work in the United States in the 1930s and 1940s, the literature relating to soil erosion and land degradation issues seems to be largely centred on a period from the early 1980s.

The early land resource material has a significant focus on the opportunity production losses and damage repair estimates stemming from agricultural land uses (eg. McConnell 1983; MacLeod 1990a; Hall and Hyberg 1991). Later material has placed increasing emphasis on damage functions, pricing and institutional arrangements (including property rights) to prevent degradation (eg. Looney 1991;

Chisholm 1987a; Blyth and McCallum 1987) as well as broader social issues such as impact on urban communities who might pay to reduce damage incidence. Spillover externalities from soil movement and dryland salinisation from tree clearing (Quiggan 1986; Osborn and Shulstad 1993) are also important, although these are less-well canvassed than spillovers involving water and atmospheric resources (Holmes 1988). Much of the literature centres on agricultural land uses (notably cropping), although acidification from fertiliser use (Harlin and Beradi 1987) and dryland salinisation through tree clearing is also prominent.

Water quality and conflicting demands for access to water bodies are classic areas in which environmental externalities and distributions of property rights are key issues. A dominant theme of the water resource quality literature centres on groundwater contamination from agricultural land uses and salinisation of water bodies through excessive inputs of irrigation water (eg. Quiggan 1991; Mattinson and Morrison 1985). To a lesser extent, there is a focus on agricultural and industrial impacts on water quality from the perspectives of recreational values of water bodies and urban and industrial uses (especially drinking water; eg. Cocks and Walker 1994; Greenly *et al.* 1982). Wetlands and their status may feature to a limited extent in this literature, although this depends on the actual attribute(s) being studied (Mitchell and Carson 1985; Lynne *et al.* 1981). Wetlands, for example, carry values for wildlife, commercial fishing and trapping, recreation and general existence values, as well as acting as vital reserves or corridors for maintaining (or saving) elements critical to biodiversity. These are largely covered in the literature of other sub-themes.

A raft of valuation approaches and/or resource use allocation/conflict resolution philosophies has been applied to water resource issues. However, it might be fair to conclude that this sub-theme has, more than some others (except perhaps air quality and noise pollution) been addressed more strongly through econometric and programming techniques (eg. linear and mathematical programming) and considerations of property rights allocations. Regional approaches to resolving water resource issues would seem to logically include integrated catchment management planning, but there is limited specific attention to this in the economic literature.

The relationship between impaired productivity and other diminished environmental attributes and property/land values has received some attention in the economic literature. To the extent that such values

should represent the capitalised value of future earning streams in a perfectly functioning market, degradation or amenity losses should quickly flow to such values. Moreover, recognition of this linkage or improvements to pricing efficiency is argued to be a motivating force to improved land and water resource management. Damage to other land values through spillovers is seen to represent a measure of the imposed externality.

Much of the literature focuses on urban/industrial issues such the effect of noise pollution and siting of public utilities on local real estate values (eg. see O'Byrne *et al.* 1985; Nelson 1982). Nevertheless, there is some work covering the impact of soil and water pollution on both rural–urban land and property values (Palmquist and Danielson 1989; Miranowski and Hammes 1984). While none of the literature uses rangelands as examples the methods and estimation techniques are potentially applicable in that context.

There is also a vast economic literature on the environmental spillover effects of urban and industrial resource uses on issues relating to air quality, noise and other amenity pollution and their effects on public health. In fact, these dominate many of the early writings on environmental spillovers, property rights and legal aspects of environmental resource exploitation. However, there appear to have been few studies specifically relating to agricultural land uses in general and rangelands in particular. This allocation of effort may well be justified within the context of extensive use and relative isolation of rangelands, although 'hot spots' might occur close to rural townships or other intensive uses (eg. mining). A potentially significant value of the literature on this topic remains its contribution of logic, valuation methods and approaches to other resource issues and land uses for which the analogy might be appropriate (eg. property rights, regulatory failure, etc.).

Restoration technology economics

Given the apparent extent of land and resource degradation in Australian rangelands, the economic literature on restoration technologies is surprisingly concentrated and recent. The major Australian focus is centred heavily on shrub encroachment issues within the context of semi-arid rangelands, particularly those of north-western New South Wales (eg. see Penman 1987; Noble *et al.* 1993; Burgess 1987). The North American literature has an apparent bias towards similar problems in the rangelands of Texas and Utah (eg. Herbel 1983; Scifres 1980).

The application context and methodological base are also generally very narrow. The majority of published

studies concentrate on partial budgeting techniques incorporated within a cost–benefit analytical framework applied to a paddock scale of evaluation (MacLeod and Johnston 1990). Limited exceptions have taken a property scale or sectoral focus employing dynamic programming (Wang and Linder 1990) and aggregate social benefit assessment techniques (Vere *et al.* 1980).

There is considerable scope for expanding this work to support land resource management at a regional level, especially in light of the claimed relationship that exists between resource degradation and enterprise size and viability. Modelling or case study work at the whole property level and/or catchment level is potentially important, especially if this could capture important feedbacks between market conditions, property size, management characteristics and resource health.

Wildlife/ feral pests/biodiversity

The presence and impact of non-domesticated animal species in agricultural regions and rangelands has received some economic attention over the years. The bulk of the available literature generally dates from the 1980s and has grown along with societal concern over resource use implications for preservation of biodiversity (eg. Brookeshire *et al.* 1983; Buckley 1994; Jakobsson and Dragun 1989). Like that dealing with wetlands, the wildlife economic literature is reasonably wide in its focus, but does tend to distinguish between wildlife and feral animals as either pest species or as socially valued features of the natural environment. This distinction is not necessarily a clear one, as some wildlife and feral species (eg. kangaroos, pigs, goats) also offer amenity through hunting and/or real or latent commercial exploitation.

In the cases where the primary focus has been on the potential for animals to damage agricultural or pastoral production, two analytical approaches have typically been followed. The first seeks estimates of aggregate opportunity production losses through surveys or sectoral aggregations from simple case budgets or models (Flavel and Gomboso 1989; Gibson and Young 1988; Wilson and MacLeod 1988). The second has been to apply optimising logic to abstract or empirically-derived damage functions and related marginal benefit functions (MacLeod 1988; Tisdell 1982, 1983). Both approaches have been criticised (not in the literature *per se*). The former have been challenged for its lack of attention to marginal gains and losses that identify optimal decision criteria. The latter typically fail to realistically capture the dynamic biological

relationships that underlie the real damage functions (eg. density dependence, predator–prey and migratory habits). Both approaches also rarely capture alternative values that are potentially placed on the target species by different stakeholder groups (eg. conservationists, hunters).

Recreational use of natural resources/ national parks/ conservation areas/ forestry/treescaping

Three sub-themes are described below: recreation; national parks and conservation areas; and forestry and preservation of treescaping.

As outdoor recreation and tourism (eg. sightseeing) have traditionally been a significant urban use of natural landscapes and water bodies, especially in North America and Europe, a substantial component of the natural resource use economics literature has been focused on this land use and conflicts with agricultural, forestry and other industrial uses of the same resources. Because these uses are often unpriced, or are priced according to indirect markets or attributes, a good deal of the literature focuses on value estimates or conflicts with uses that do have tighter market-based values (eg. hydro-electric power generation, highway development, land clearing, forestry; Delacey 1987; Driver and Burch 1988; Beeton and Collins 1985). With a few exceptions (Delforce *et al.* 1986a,b), little of the literature has focused directly on rangeland applications and much would appear to fall within the earlier identified category of case examples to support the academic refinement of a given valuation technique (eg. travel cost, hedonic pricing, contingent valuation) rather than the application of a mature valuation methodology to a pressing policy problem.

Nevertheless, recreation (and its near relation—eco-tourism) is of growing importance to many regional economies and a frequently used justification for maintaining or expanding infrastructure in isolated rangeland regions in particular. The extent to which these resource uses are compatible or potentially in conflict with more traditional rangeland resource uses (eg. pastoralism, mining) is an open question and one amenable to planning procedures. Of particular interest is the extent to which recreation and tourism in isolated regional contexts can offer a diversity of economic options that could improve the, otherwise marginal, viability prospects of many rangeland enterprises.

Many of the issues surrounding recreation, tourism and conservation of biodiversity have as their focus formally defined conservation areas such as national parks and/or other reserves where conservation of biota, landscapes or certain aesthetic attributes (eg.

scenic outlooks) are the primary values. Therefore, much of the economic literature surrounding these issues overlaps. That is, the relative price ratios that in a market economy would ordinarily efficiently direct resources between, for example, agricultural development of preservation areas, exclude significant elements of social value associated with the latter use. These include the various values associated with active uses such as recreation and more passive values associated with such things as retaining options or existence values for certain species or resource suites not traditionally traded in markets (Bennett 1984a; 1991a; Hundloe *et al.* 1990). Other considerations might include the levels of a particular attribute that might be promoted within the broad use of nature conservation, as well as resolving conflicts between uses such as recreation and preservation of wilderness values through exclusion of access (eg. Bennett 1984b; Carter 1987; Imber *et al.* 1991).

The common denominator for this sub-theme is largely the focus on 'trees'. Much of the early tree-related economic literature tends to be divided between the economics of particular forestry practices such as rotations and various harvesting technologies, comparisons between the relative profitability of forestry and agricultural enterprises (especially on marginal farming country) and conflicts between forestry practices and resource conservation values (largely of urban dwellers). The first two issues are largely internal ones to be resolved by individual decision-makers consistent with their specific management objectives, although they can have external effects of interest to resource planners (eg. forestry enterprises might confer benefits from reduced salt accession to water tables, or impair visual aspects of the rural landscape). The last issue is of definite interest to regional planning. The selected literature is largely focused on: potential conflicts between timber harvesting and conservation activities (Kula 1986; Roger 1992; Streeting and Hamilton 1991); the wider issue of multiple use of forest lands which typically places a high emphasis on public access for recreation activities (Galapitige 1991; RAC 1992a); and tree decline in landscapes due to agricultural or urban land use practices (Ekanayake 1985; Tisdell 1985).

Sustainable resource management/ ecological economics

There is a reasonably extensive, and growing, economic literature dealing with issues relating to sustainable agriculture, sustainable resource management, and ecologically sustainable development (eg. Batie 1989; Douglas 1985; ESD

Working Groups 1991). This literature has largely paralleled the broad social trend towards sustainable resource use, development and population growth emerging from the 1980s and, perhaps punctuated, by international and national 'statements' such as signing the Rio treaty, nominations for World Heritage listing (eg. Willandra Lakes, South West Tasmania, Wet Tropics) 'decades' of Landcare and so on. In many ways, it is a simple extension of the earlier social and disciplinary trends identified with the emergence and growth of ecology and natural resource economics in general. Associated with this trend has also been the emergence of ecological economics as a challenge to (or alternative) to the predominant neo-classical (rational optimisation) paradigm that underpins much existing economic thinking and practice.

A principal characteristic of ecological economics is the greater integration of ecological theories and concepts into decision-making models, including the feedbacks between resource uses and the state of the environment (Common 1991b). Non-linearity of processes, and attempts to incorporate a wider array of social dimensions into private and public objective functions might also characterise this work. This seems to carry potential implications for analysing regional resource use decision contexts involving natural systems and multiple stakeholders with divergent interests. However, the theoretical and empirical bases of the ecological economics 'school' or discipline are still evolving.

With respect to the thrust for sustainable agriculture and resource use, especially within the context of rangelands pastoral enterprises, a significant common element of most definitions is a dual recognition that production enterprises need to be economically viable and the underpinning processes ecologically viable (eg. Barbier 1987; Campbell 1988; Cary 1992). The further marriage of ecological understanding and feedback mechanisms emerging within both the applied rangeland ecology and ecological economics literature to the earlier economic insights of property adjustment theory can lay the path to describing and promoting the flexible and adaptive pastoral enterprises that might be consistent with this concept. Appropriate institutional frameworks (eg. finance, tenure) canvassed in the sectoral viability literature would also promote this ideal (Adger and Whitby 1992; Common 1991a). Inclusion of non-pastoral, or at least pastoral-sympathetic, resource uses (including multiple use options) would expand private managers decision options and might also potentially promote outcomes that are more consistent with the broader public interest.

A third aspect of the definitions and debate surrounding sustainable resource use is the issue of intergenerational equity; that is, making choices that leave open the options of future generations or (if irreversible) adequate compensation for damage to their interests. Failure to do this is indicative of a class of externality whose importance and resolution have attracted a growing economic literature (Chisholm and Clark 1992; Collins and Young 1991). A related issue is the anthropocentric focus of valuation efforts centred on preserving other species (eg. bilbies). While these issues remain topical and unresolved, they are beyond the focus of this review. They are raised merely to highlight issues that regional resource planning frameworks might, in a more informed world, ideally seek to address.

Economic impact assessment models

Many of the above techniques and models can themselves be applied wholly or in part to the prediction of economic impacts arising from land use change at the regional level. Such techniques have been particularly developed and utilised in the evolving comprehensive regional assessment processes currently being undertaken in the forest sector. The Commonwealth Department of Primary Industries and Energy (DPIE 1994) has developed a forest utilisation model as a generic model for determining the impact of changes to regional forest industries. The model is constructed around harvesting, processing and market delivery activities and generates a spatial flow of wood through these stages. It allows resultant prediction of direct employment demand.

Within this framework, linear programming models are applied to estimate the net returns or value-adding from forestry over time. A land use accounting system that shifts forest land units between timber and non-wood production categories enables assessment of changes in forest resource use tenure over time. In addition, changes to industry structure or the market outlook for wood products can be measured in terms of changes to the values the model generates (DPIE 1994).

6.2 Improving Regional Resource Use Planning Negotiation and Procedures

In recent years, there have been some limited methodological developments to assist the shift from more technical planning procedures to more negotiatory processes. Many of these developments have arisen in support of key sectors of the

community which have won improved rights to access land use allocation processes through legislation (eg. the *Native Title Act*). The following sections outline some innovative methods that may be used to promote negotiated approaches.

6.2.1 Conflict prediction or prevention methods

One of the key purposes of regional planning is to manage increasing conflict over resource use. Several authors have written about procedures and methods specifically designed to actually predict resource use conflict and prevent future social impacts. Wei-Ning Xiang (1992:17), for example, applies GIS techniques jointly with multi-criteria decision-making models to predict land use conflict, therefore allowing the development of appropriate strategies to prevent the development of these conflicts within regional and other land use planning exercises. One of the limitations of this approach is that it can stimulate existing conflicts rather than actually facilitating a negotiated resolution. It is, however, useful in informing those preparing to facilitate a process of negotiated land use change or as a basis for economic assessment of mitigation costs.

6.2.2 Techniques to assist structuring negotiation processes

With a reasonable information base and a structure in place for bringing stakeholders to the negotiation table, there are various techniques that can be applied to explore negotiable resource use options. RAC (1992b) outlines methods and procedures which can be used in this context. In particular, it outlines the potential application of scenario analysis, multi-criteria analysis and risk analysis in evaluating resource use options. While many of these techniques evolved for the benefit of centralised decision-making, they are equally useful in multi-stakeholder situations.

Scenario analysis relies on the development of alternative futures to construct, represent and assess options in resource negotiations. This involves considering the implications of 'what if' questions about the future. It may also involve critical examination of the underlying assumptions, their feasibility and internal consistency, and sensitivity to specified variation (RAC 1992a:40). On the other hand, multi-criteria analysis can be viewed as a set of procedures "designed to identify and organise information relevant to various steps in the decision making process" (RAC 1992a:41). It involves stakeholders specifying the options to be examined, establishing the disadvantages and advantages,

establishing a weighting for each criterion, and using this information to inform negotiations. Similarly, qualitative and quantitative risk assessment methods can be used to inform these processes (see RAC 1992a:43). Their strength lies in their explicit recognition of the multi-dimensionality of the decision problem. In particular, this approach has the potential to provide a mechanism for facilitating mediation and negotiation processes where there are conflicting resource use options.

6.2.3 Strategic perspectives analysis

As the above procedures recognise, the resolution of land use conflict require more than a centralised agency analysing relevant resource information and stakeholder views. The values and aspirations of competing groups fundamentally underpin such conflicts, and the principles developed in chapter 3 dictate that more facilitative procedures are needed to both identify potential conflicts and to support equitable negotiations. To address this need, Dale and Lane (1994) apply 'strategic perspectives analysis' as a procedure for both participatory and political forms of resource decision-making. The procedure can be applied in organising regional planning processes, and it is useful in identifying key stakeholders, thoroughly exploring their interests and capabilities in resource use, and in seeking appropriate avenues for conflict resolution. It can also be used to evaluate whether planning processes are equitable and effective (Carman and Keith 1994:51).

Depending on the context in which it is applied, the procedure can be used by planning facilitators or by marginalised groups affected by a land use conflict. In these circumstances, the procedure can be applied by such groups to articulate their own vision, aspirations and strategies in relation to resource use, and to improve their negotiatory effectiveness (Carman and Keith 1994:51).

6.2.4 Regional plan evaluation and impact assessment methods

Many of the integrative methods already discussed above can be applied in one form or another to the regional plan evaluation or impact assessment. CBA and other fiscal appraisal techniques have often been applied, though many of the limitations already discussed still apply. In particular, CBA does not resolve trade-offs between equity and efficiency, between quantifiables and intangibles and between technical procedures and the need for negotiated outcomes (see Shefer and Kaess 1990:101). Planning balance sheet (PBS) and goal achievement matrix (GAM) methods came into use as a result of these

unresolved challenges, but their similarities have sparked much debate over their respective contributions and shortcomings (Shefer and Kaess 1990:101). While PBS is a more direct descendant of CBA, it adds time and physical scales to the equation. GAM breaks away from financial appraisal methods and evaluates projects by determining the extent to which they fulfil the explicit objectives of any group identified as being affected by a regional plan (Shefer and Kaess 1990:101). This more open framework encourages improved stakeholder participation and encourages the planner to take a more advisory or facilitative role within the planning process. Strategic perspective analysis (Dale and Lane 1994), while developed to prepare for and to undertake project planning, can equally be applied to evaluate plans from a variety of stakeholder perspectives and to facilitate negotiated resolution of outstanding issues and conflicts

The application of multi-variate analysis in the evaluation of regional plans is equally responsive to the need to take several competing stakeholder groups into account. Shefer and Kaess (1990:103) evaluate a range of multi-variate methods and more recent innovations in this area.

6.2.5 Implementing regional plan outcomes

As seen in chapter 4, the implementation of regional planning outputs is often limited by little attention being paid to implementation arrangements. Any arrangements developed need to be carefully negotiated within the planning process, and clear systems put in place for continuing the negotiations once the plan's outcomes are being monitored. Unfortunately, the regional planning literature does not adequately deal with innovative techniques for ensuring regional plans are implemented. Appendix 2 summarises some potential and practical examples which have been gleaned from our review of regional planning across Australia in chapter 4. These include binding agreements established to drive monitoring and renegotiation of plan outputs and outcomes, and clear mechanisms for the integration of regional plans in local government planning schemes.

6.3 Improving Stakeholder Group Facilitation

There is a range of community participation and community development processes that can be used in building the capacity of stakeholder groups to be fully representative and politically effective. The following techniques provide innovative options that can be used by interest groups to involve their

constituency in the planning that needs to be undertaken to prepare for that group's involvement in the negotiation arena for regional resource use planning. It is important to note, however, that there are an endless range of participative techniques which could potentially be applied in different contexts. In choosing particular techniques for application, it is important to consider whether or not the principles outlined in section 3.5 are being adhered to. The following techniques are by no means exhaustive, but they could potentially be applied within regional resource use planning in rangelands. For a more detailed assessment of potential techniques which could be applied to enhance participation within stakeholder groups involved in regional planning, see Maywald (1989), Sarkissian and Perlgut (1989) and Carman and Keith (1994).

6.3.1 Mapping actors and arenas

In preparing to involve their constituents in planning in preparation for regional negotiations, stakeholder groups may benefit from mapping out the key constituent actors that they need to involve and determining the arenas within which they operate (eg. see Fischer and Keith 1977). Mapping out actors and arenas in this way allows the stakeholder groups to plan strategies for the equitable involvement of those groups that may, for political or physical reasons, be marginalised.

6.3.2 Resourcing for equitable participation

One way to ensure equitable participation within stakeholder groups is to ensure that resources existing within and provided to such groups are equitably distributed. Boesveld and Postel-Carter (1991:147) suggest that stakeholder groups can checklist data on the work and living conditions of those constituents (eg. women, particular families or clans, etc.) that are at risk of limited participation. Where a particular agency is facilitating regional planning, checklisting approaches can be used to ensure that support and resourcing for stakeholder groups are being applied effectively. Stakeholder group leaders, however, need to apply such conditions while understanding the cultural context in which these 'at risk' members find themselves. Regional planners, however, need to be careful in applying such conditions. Overt intervention (by planners from outside the stakeholder group) to ensure the involvement of 'at risk' constituents could result in them being further marginalised.

6.3.3 Community-based education, leadership training and personal development

Stakeholder groups can enhance the participation of their constituents by facilitating broad education about environmental and land management issues in their areas of concern. Equally, providing leadership training and personal development opportunities may build additional capacity within the group (see Mill 1996). These activities improve the ability of interest groups to plan and to be involved in negotiations over resource management. The Kowanyama Aboriginal Land and Natural Resource Management Office on western Cape York Peninsula, for example, is a significant stakeholder in ICM in the Mitchell River watershed. It has a detailed community-education strategy, including the development of an accredited natural resources management curriculum in the school, and community education programs about burning and coastal care (KALNRMO 1994:20).

6.3.4 Community-based monitoring arrangements

One practical way to improve the effectiveness of participation of stakeholder group constituents is to directly involve as many people as is possible in the data collection and monitoring needed to inform the group's involvement in negotiation. This not only assists the strength of the plan making process in an educational sense, but also continues to develop group ownership and commitment to the negotiation process. Alexandra *et al.* (1996) have recently published a directory of community-based groups involved in environmental monitoring across Australia. They consider that the direct involvement of constituents in environmental monitoring leads participants to develop a stronger sense of responsibility for managing resources.

Interest groups can also strive to engage their constituents as much as possible in monitoring and evaluating the plans they use as the basis for their involvement in resource management negotiations. Apart from involving people in the collection of physical data, as discussed above, considerable effort should be put into monitoring how people feel their interests are being met by both the stakeholder group's planning and the overall negotiation process. ATSIC (1994a:40) outlines a number of techniques that can be used to achieve this.

7. Review Conclusions: Future R&D Priorities in Regional Resource Use Planning

In this final chapter we summarise the review findings and establish key R&D priorities for regional resource use planning activities in Australian rangelands. In establishing these priorities, we have also attempted to identify opportunities for applying improved techniques and procedures within regional resource use planning R&D (eg. the techniques and procedures explored in chapter 6). Some of the R&D priorities outlined previously have been identified in the research literature and in various government inquiries. The rest are priorities which have emerged from this review.

7.1 Significant Political Support for Regional Resource Use Planning

Across Australia, there have been significant political demands for more integrated regional approaches to resource use planning. While these calls have come from Commonwealth and State government agencies, industry sectors and other stakeholder groups, there is a wide divergence of views about how they might be achieved. There is, for example, a stark contrast between academic, conservation, indigenous and agency-based calls for greater government intervention, and industry based calls for improved resourcing and support for self-regulation. These differences have been sharply defined in recent times by the vociferous response of industry groups to the draft National Rangelands Strategy.

Viewed from any perspective, it appears that there is strong support for more regional approaches. Some of these political demands are clearly and unambiguously articulated (eg, see the National Rangelands Strategy). Others are more vaguely articulated in general policy statements supporting moves towards ESD principles and practices (eg. environmental policies developed in the mining industry). Whether these statements are clear or ambiguous, most agencies, sectors, stakeholder

groups and even academic institutions remain unclear about what sustainable development actually entails, and how the concept can be applied effectively on a regional basis. This means much progress needs to be made if systems of planning that deliver on the political rhetoric are to be established.

R&D Priority No. 1:

R&D must focus on better conceptualising ESD at the regional level. This will require equitable negotiations among key stakeholders aimed at reaching consensus on what a sustainable region actually constitutes (eg. what constitutes an adequate and representative reserve system; what are equitable resource allocations; what pastoral practices do not constitute sustainable production; what indicators should be used to monitor sustainability). This requires a strong R&D emphasis on working towards regionally acceptable characterisations of sustainability.

While regional aspects of ESD remain poorly defined, there is also continuing confusion among commentators about what it is that regional approaches to resource use planning can deliver in addition to integrated catchment management and more local scale activities (eg. Landcare and property management planning). In practice it remains unclear what mechanisms and linkages are required to ensure effective interrelationships among these processes. In theory, however, the principles of regional resource use planning outlined in this review would suggest that a two-way flow of benefits between regional, State/national and local levels can and must be achieved.

R&D Priority No. 2:

The most effective ways of linking resource use planning processes at different scales (eg. from regional to catchment to property level) need to be determined through specific research. Research into regional approaches should not be at the expense of, and in isolation from continuing improvements in planning and management at these other scales. R&D activities

need to identify ways for regional resource use planning to complement rather than duplicate resource use planning activities at more local scales.

7.2 Elements and Principles of Regional Resource Use Planning

Planning studies have gradually moved away from the old technical, rational forms of planning, which were determined and driven by centralised government agencies, towards more realistic characterisations of planning that recognise the plurality of stakeholder interests, such as those that exist in rangelands environments. We suggest that regional resource use planning must move towards more flexible approaches that facilitate equitable negotiations among these interests, within the bounds of the laws that govern resource use. Where current legal and administrative systems constrain the effectiveness of these processes, however, there is a case for legal and administrative reform.

If a more negotiatory basis for regional planning is to be achieved, the results of our review suggest that three primary elements of regional planning need to be targeted: (i) the application of technically sound and innovative assessment methods in the social, economic and environmental sciences, to underpin these negotiation processes; (ii) appropriate institutional and support arrangements, to facilitate equitable negotiations among stakeholders; and (iii) implementation of clear mechanisms to enhance the participation of constituents within those stakeholder groups represented in the negotiations that constitute the regional planning arena.

A focus on improving these elements will rely on access to a wide range of sources, including: the traditional planning and information technology literature; technical texts on various forms of economic, social and environmental assessment; the bargaining and negotiation literature; and finally the community development and group facilitation field. R&D developments in regional planning equally need to be focused across these areas. In each area, however, we suggest that common attention needs to be given to the application of the principles of effectiveness, efficiency, sustainability, integration, adequacy, equity, adaptiveness and accountability; ensuring that no one research area evolves in a way that usurps adequate consideration of the other two.

R&D Priority No. 3:

In establishing future R&D priorities, equal attention should be given to technical assessment, negotiatory and intra-group participatory aspects of regional resource use planning. To date, however, most of the R&D effort in rangelands has focused on technical assessment issues in a centralised management context. Some initial redistributive effort may be needed to patch existing gaps in available knowledge.

7.3 Lots of Planning: Little Institutional Learning

Regional resource use planning is not a 'brand new' planning phenomenon across Australia. There is a significant level of activity and a wealth of institutional arrangements in place which encourage regional planning approaches. Grave deficiencies, however, are evident in these practices and arrangements when viewed against our core regional planning principles. Most are largely centralised planning processes which have focused on non-integrated themes of economic or social development, or on conservation estate-based environmental protection. Moreover, there have been very few formal evaluations of these practices and arrangements, and where such reviews have occurred, they are often limited in their scope and findings. The existing evaluative literature has often not as part of the system of monitoring within these processes.. It is often carried out by independent researchers. There is not a clear institutional culture which supports adaptive management approaches. Contemporary evaluative activity does not drive reform in regional planning practice. There remains a dire need for R&D to focus on evaluating the strengths and weaknesses of our regional resource use planning systems in ways which facilitate and underpin appropriate and adaptive reforms.

R&D Priority No. 4:

Given the wealth of regional planning activity in this country and the lack of evaluative research, greater priority should be placed on R&D which evaluates current processes before substantial investments are made in new approaches within rangelands. These activities should be established in ways that maximise adaptive planning and management reforms. At the same time, strong evaluative components should be built into any R&D activities seeking to experiment with regional approaches to planning in rangelands.

7.4 Technical Deficiencies in Regional Resource Use Planning

Analytical frameworks

By and large, regional resource use planning in Australia has isolated regional action into narrow themes (eg. economic or social development, environmental protection, resource development, or even poorly integrated approaches to particular industry sectors). If regional planning is to deliver equitable and sustainable outcomes, it needs to become more flexible and adaptive; reflecting the complexity and interconnectedness of natural and human management systems. Given that regional resource use planning problems can rarely be isolated from these systems, more effective analytical tools and frameworks are required to reach meaningful decisions. These tools and frameworks need to improve our ability to formulate and characterise our understanding of regional resource use planning problems as well as engender adaptive planning and management practices. The assessment of trade-offs will inevitably flow from such an approach.

R&D Priority No. 5:

A key R&D priority is the development of more effective tools and frameworks for analysing and supporting resource use trade-offs in multi-objective and multi-use contexts. These will need to encompass a variety of complementary environmental, economic and social assessment techniques or methods that can be matched flexibly to a particular problem or issue, that can account for interactions among land uses and that are able to accommodate the historical and socio-political context in which resource use and management decision-making are embedded.

Monitoring and evaluation will need to be an integral on-going part of this approach in order to: (i) integrate the various perspectives, skills and knowledge of the different regional stakeholders; (ii) feed back into, and build ownership of, the regional planning process over time; and (iii) challenge institutions as well as resource users to adapt behaviours. In particular, the adaptive ecosystem management approach will require an increasing focus on the identification of practical environmental, social and economic indicators of sustainability, as well as monitoring and evaluating changes through time. Current practices have focused on monitoring and assessment methods at the local scale with little attention to the broader, regional scale indicators. Moreover, these approaches have focused on modelling production and resource management systems and their condition. There have been few attempts to translate these assessments into

identifying appropriate and practical response options for resource users in a timely way.

R&D Priority No. 6:

Given that desirable environmental responses to changes in resource use and management may take a long time to become evident at a regional scale, it is important to identify indicators of sustainability that reflect improvements in decision-making processes as well as resource or environmental condition. These indicators need to be assessable in a timely and cost effective manner. In turn, they need to be linked to tools or techniques that facilitate the evaluation of the suite of appropriate resource use options and their implications for ESD.

Support for learning processes

Regional resource use planning involves multiple stakeholders, perspectives and decision-making processes embedded in broader cultural, social and political value systems. There is a need for the different regional stakeholder groups to recognise conflicting values, competing interests, and differing expectations. This requires more informed and open communication within regional communities, and a greater awareness of, and more equitable access to, the full range of useful knowledge or expertise relevant to the resource use problem being tackled. Important also is the recognition and communication of uncertainty relating to much information that is relevant to regional resource use planning.

R&D Priority No. 7:

R&D support for integrated, adaptive systems approaches to regional resource use planning should place priority on the development of information technology tools or procedures that facilitate collaborative learning processes (eg. through providing an arena for bargaining and negotiation among multiple actors). Such tools and procedures should be designed to: (i) foster the exploration and recognition of differing perspectives of the various regional groups toward resource use and management issues; (ii) provide equitable access to information; and (iii) recognise and clearly communicate uncertainties relating to information and the underlying assumptions of alternative resource use options and their implications to ESD. In this context, a key research priority is the development of a better understanding of the contribution that technical information (ie. scientific, policy and management) can make to regional resource use planning decision-making and policy development.

Social and cultural considerations

Social and cultural aspects of development have received the least attention of all components of regional resource use planning. Deficiencies needing priority attention that have been identified in this

review include those outlined in Table 8. Regional resource use planning activities in Australia have rarely come to terms with the socio-economic processes that drive the region, and have often failed to identify and recognise the wide range of social values held by different stakeholder groups. Consequently, the delivery of community and human

services has received little or no attention, even though these may be critical in underpinning economic productivity within a region, or in assisting the smooth implementation of regional restructure.

Table 8. Future R&D priorities in regional social and cultural assessment

Research priority	Key research issues
Improved understanding of socio-economic processes operating within rangelands.	<p>Improving our understanding of social/ psychological values, perceptions needs and expectations (Holmes 1996a:37; Winter and Williams 1996:24).</p> <p>Improving the decision supports for rangeland land managers and communication channels between managers (Holmes 1996b:37).</p> <p>Exploring and improving the effectiveness of education and extension (Holmes 1996b:37).</p> <p>Understanding the nature of intra-regional social linkages (Holmes 1996b:37).</p> <p>Examining effective community education and development processes in rangeland communities (Winter and Williams 1996:24).</p>
Improved techniques and tools for assessing social need and developing appropriate human service delivery mechanisms	<p>Developing effective benchmarks that can be applied to regional service delivery planning and within impact assessment processes (Jones and Thornewaite 1994:102).</p> <p>Exploring and developing more effective systems for linking human services planning and provision to the land use planning and impact assessment system (see Jones and Thornewaite 1994:102).</p> <p>Exploring and developing more appropriate service delivery models for rural communities undergoing social and economic stress.</p>
Improved integration of cultural heritage considerations within regional planning	<p>Exploring and developing ways to support indigenous bodies to undertake their own cultural heritage assessment work as a basis for negotiation of resource use issues.</p> <p>Exploring methods to more directly involve communities in identifying and preserving the culturally and socially important places and traditions within the region.</p>
Improved integration of social considerations within regional resource use planning.	<p>Exploring ways to translate social goals in regional plans into implementable strategies (Jones and Thornewaite 1994:103).</p> <p>Developing clear performance criteria which can be written into regional plans in ways that will influence land use decisions.</p> <p>Better understanding the relationship between human service delivery, economic productivity and the adoption of sustainable management practices.</p>

R&D Priority No. 8:

In relation to technical aspects of regional resource use planning, some redistributive effort should be put into building our understanding of social and cultural aspects of regional development. Particular emphasis should be placed on understanding the social processes which underpin the way regions function, integrating cultural heritage considerations into land management and better understanding the relationship between human service delivery, economic efficiency and sustainable management.

Economic considerations

Our review of the literature indicates that it is difficult to pinpoint specific areas towards which further economic research might be directed within the domain of regional resource planning. To the extent that coalitions of interests and conflicts between multiple stakeholders and potential resource uses will determine desirable planning and land use outcomes, the nature of those interests and desired outcomes will ultimately determine information gaps and the R&D agenda. That is, the context necessarily determines the need for and utility of any R&D investment. Despite these limitations, the following areas appear most likely to need further R&D.

Firstly, the determinants of enterprise and regional economic viability remain an unresolved issue. This is necessarily the case in the absence of a prescriptive understanding of the interplay of the physical, financial and human factors that promote flexible and adaptive enterprise structures in an environment characterised by climatic, market and institutional risk. Non-traditional options (eg. native seed production, wildlife domestication, eco-tourism), while often mooted, are largely under-analysed, especially with respect to growth potential and aggregative capacity.

Secondly, economic welfare is promoted in the narrow sense when the marginal social benefit of the last unit employed/produced is equal to the marginal social cost. This works fine if all of the competing exploitation and conservation values are both identified and specified and the benefit is compared against a social welfare function grounded in a fair distribution of resources and property rights. That such values (apart from narrow exploitation values) are rarely identified with confidence and social welfare functions remain largely indeterminate remains a problem. Improvements can be made in both valuation theory (eg. choice modelling) and application.

Finally, economic evaluations of rangeland resource use options are commonly made at an unrealistically

fine scale (paddock or smaller) and there is lack of realism in terms of process and context over scales more appropriate to resource use decision-making (property, catchment or region). Feedbacks, including important temporal and spatial externalities, are rarely incorporated within economic models of rangeland resource use. There is some scope to address this issue within the context of capturing and synthesising existing knowledge from a range of applied disciplines, perhaps bolstered by simulation modelling. More realistically, the gap will require new R&D initiatives centred on ecosystem and human system processes that remain poorly specified and understood.

R&D Priority No. 9:

R&D priorities in regional resource use aspects of economic assessment need further refinement, but should at least focus on regional aspects of sectoral viability, more robust systems for valuing economic resources and stronger systems-based approaches to economic modelling which can be applied effectively across spatial and temporal scales.

7.5 Negotiatory and Procedural Aspects of Regional Resource Use Planning

In this review, we have found that regional resource use planning in Australia remains a largely centralised process of governance, often with only limited mechanisms for facilitating equitable negotiation among key resource users. The focus of planning has often been on the development of regional structure plans used by centralised authorities to regulate land use, rather than as frameworks to negotiate solutions to the conflicting views of regional stakeholders. Consequently, such planning has generally not been effective in either reaching binding agreements between stakeholders and in managing conflict when development proposals are presented for assessment by regulatory agencies.

The current institutional arrangements in place for regional planning reinforce these inequities. In other situations, the institutional arrangements are flexible enough to encourage negotiatory processes, but they are not administered in ways which take advantage of these opportunities. Many of the institutional arrangements are set up to meet the needs of particular resource management agencies or land managers, rather than being developed to achieve integrated management regimes. They rarely establish effective monitoring and evaluative regimes

that continue to build the negotiatory spirit among key stakeholder groups once initial regional planning has been completed.

Table 9 details identified R&D priorities for improving regional resource use planning as an effective and equitable framework for negotiation among competing stakeholders with an interest in resource use and management. The priorities focus on improving negotiation processes, institutional arrangements and monitoring and evaluating procedures for plan implementation.

R&D Priority No. 10:

Substantial R&D effort is needed to explore the most effective institutional arrangements and conditions for facilitating negotiation among stakeholders that can result in binding agreement over regional aspects of resource management. In particular, there is a need to redefine the organisational context within which planning occurs, and to establish mechanisms for improving the basis for negotiation that are likely to be adopted by contemporary planning agencies.

Table 9. Future R&D priorities in regional approaches to negotiation

Research priority	Key research issues
Regional planning as a basis for inter-stakeholder negotiations.	Providing an efficient balance between regional planning process and cost (Morton 1994:10). Improving mechanisms for stakeholder value identification and expression (Morton 1994:10). Maintaining the dynamic within negotiation processes (Morton 1994:10). Designing processes that can admit a plurality of interests and that promote interactive rather than autocratic solutions (Dorcey 1986). Designing better tools to model negotiation processes (Dorcey 1986). Improving the effective use of knowledge bases by asking how much better decisions would be with specific improvements in the planning information (Dorcey 1986). Exploring non-Eurocentric models of negotiation for resource use (Craig 1991:125). Exploring the potential application of regional planning to regional agreements negotiated under <i>Native Title Act 1993</i> (Cowell 1996). Using actor and arena models to plan negotiations and/or predict outcomes.
Better understanding the organisational context of planning.	Improving organisational analysis as a fundamental component of regional planning (Howlett 1996:iii). Examining the role of the State in regional planning activity (Howlett 1996:iii). Developing policies and organisational structures that have the capacity and flexibility to resolve cross and inter-sectoral resource use conflicts (Sandford 1992:181). Improved understanding of inter-regional linkages. Exploration of regional planning to provide a context for action as well as research coordination (Morton 1994:10).
Improved mechanisms for implementing, monitoring and evaluating regional planning.	Mechanisms for maintaining the support for regional planning beyond plan production. Exploring the use of impact assessment to plan evaluation.

7.6 Getting Strong Participation Within Stakeholder Groups

The tendency for the academic literature to focus on general aspects of public participation within planning has done little to develop a better theoretical understanding of negotiatory approaches to planning. The vast public participation literature would suggest that mechanisms for consulting members of the general public are well known. These mechanisms, however, rarely challenge the traditional, centralist mode of planning in ways that genuine attempts at inter-stakeholder negotiation can.

Through this review, we have found that most regional planning activities expound and practice various forms of consultation with the general community. Few, however, are committed to spreading decision-making power across a broader range of stakeholders. When stakeholders *are* brought into the process, they are often limited to local government and industry sectors, and often exclude community-based interests. This is often done on the premise that elected officials are involved in such processes to represent the interests of *all* their constituent within the region. Even in situations where cross stakeholder committees are established, little consideration is given to the resources and mechanisms needed to ensure that they are able to effectively and equitably represent their constituents.

Greater R&D emphasis on improving the participation of constituent members within stakeholder groups is necessary if agreements negotiated at the regional level are to be credible and durable. It is also necessary in creating a culture of support for change towards sustainable and equitable resource management systems within the region.

R&D Priority No. 11:

Substantial R&D effort is needed to explore cost-efficient ways to establish equitable mechanisms to support stakeholder groups to establish and maintain a clear mandate from their constituents during regional negotiations. Particular emphasis should be placed on improving mechanisms (eg. participant funding, etc.) for resourcing stakeholder groups to carry out representative functions and developing improved techniques to empower individuals and groups to develop their own planning and negotiation skills.

7.7 Concluding Comments

There is strong national interest in viewing the planning and management of rangelands from a regional perspective. This is reflected in the new national emphasis on regional resource use planning emerging from implementation of the new Federal National Heritage Trust and Rural Partnership Programs. It is also reflected in the intent of regional land use agreements proposed under the current amendments to the *Native Title Act 1993*. In addition to this, there is a range of new initiatives driven by State and local governments across Australia (eg. consider new activities in the Gulf of Carpentaria and the Kimberley) as well as new regional initiatives being pursued in the community and industry sectors.

Given the current ecological, social and environmental challenges facing this most extensive of Australian resource bases, it is important that the next tentative steps towards such approaches address the issues identified in this review. It would be tragic if new attempts to deal with regional issues in rangelands do not progress from an understanding of the strengths and weaknesses of previous regional resource use planning experiments across the country and overseas.

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Appendix 1.

Summary of Institutional Arrangements for Regional Resource Use Planning in State's with Significant Rangeland Areas

INSTITUTIONAL ARRANGEMENT	CHARACTERISTICS OF THE RESULTANT PLANNING PROCESSES
Institutional arrangements for regional resource use planning in Queensland	
<p>World Heritage planning</p> <p>Great Sandy Region Wet Tropics Great Barrier Reef</p>	<p>Need for regional approach established by World Heritage listing. Focus on management of the World Heritage values of the regions. See Table 5 for legislative and administrative basis. Some attempts to integrate social and economic considerations. Attempts to negotiate management among key resource users. Formal management plans developed with community consultation and released for specified periods of time. Result in strategic plans with zoning maps as basis for regulation.</p>
<p>Regional frameworks growth management</p> <p>SEQ2001 FNQ2010 Wide Bay Burnett GLADA Process</p> <p>WHAM 2015 CQRDC Process</p>	<p>Need arose because of the impacts of rapid urban growth and development in environmentally sensitive regions. Focus on managing the impacts of growth and achieving infrastructure coordination. Financially and administratively sponsored by the Queensland Department of Local Government and Planning. Regional Planning Advisory Committee's established with cross sectoral representation. Facilitated broad community participation. Resulted in Regional framework for growth management and sectoral strategies aimed at influencing planning schemes and development assessment processes. Implementation to be monitored by Regional Coordinating Committees.</p>
<p>VROC-driven processes</p> <p>Eastern Downs and Central Western Queensland Regional Organisations of Councils</p>	<p>Driven by VROCs to coordinate regional land use planning, economic and infrastructure development. Usually undertaken by VROCs or REDOs, sometimes with reference groups or consultative committees. Usually strongly focused on regional economic development and infrastructure coordination. Usually result in regional development strategies, but may also result in regional environmental strategies. Implemented as part of VROC/REDO operations.</p>
<p>Regional restructure processes</p> <p>South West Strategy Desert Uplands Strategy</p>	<p>Driven by urgent need for restructure of regional rural industries for reasons such as historical closer settlement policies, declining terms of trade and inappropriate past management practices. Focus on involving community in addressing social, resource use and conservation issues and establishing a property reconstruction initiative. Interdepartmental working group established to investigate regional options to solve economic, social and environmental problems. Undertook widespread consultation with landholders, local government, financial institutions, industry and community groups. Resulted in a significant Commonwealth/State funding package to implement detailed strategy, largely via coordinating existing resources.</p>

INSTITUTIONAL ARRANGEMENT	CHARACTERISTICS OF THE RESULTANT PLANNING PROCESSES
<p>Joint Commonwealth/State regional planning</p> <p>CYPLUS Gulf Multiple Use Strategic Plan.</p>	<p>Driven by national public concern for the protection of Aboriginal interests and the wilderness values of Cape York Peninsula.</p> <p>Focus on establishing a clear policy framework for decision making.</p> <p>Joint Federal/State funding, though run by the Queensland Office of the Coordinator General.</p> <p>Technical Taskforce established to run Natural Resource and Public Participation programs.</p> <p>Resulted in a series of technical reports regarding a range of sectoral and specific issues.</p> <p>Currently progressing to Stage II, though independent negotiations proceeding among key community and industry stakeholders.</p>
<p>Tree clearing guidelines</p> <p>38 local regions</p>	<p>Established as a result of concerns about land degradation and biodiversity loss, particularly in Queensland's rangelands.</p> <p>Focus on establishing locally negotiated guidelines for regulation of tree clearance permits by the Department of Natural Resources.</p> <p>Local committees consulted widely to establish guidelines endorsed by natural resource departments.</p> <p>Local guidelines still currently being developed.</p>
<p>Regional manager's forums</p> <p>Cover service delivery regions across State</p>	<p>Established to improve coordination across State government agencies at the regional level.</p> <p>Focus on information exchange and service/infrastructure coordination.</p> <p>Currently only includes regional managers of State departments, but local government sometimes involved.</p> <p>Is not a decision-making or planning structure.</p>
<p>Regional infrastructure planning</p> <p>Carpentaria Mt Isa Mineral Province Study Gulf SIA</p>	<p>Established where significant development pressure results in need for greater infrastructure coordination.</p> <p>Focus on the State and other agencies identifying priorities for economic infrastructure investment and coordination among private, Commonwealth, State and local government providers.</p> <p>Focus is efficient economic development.</p> <p>Implementation often monitored by joint committees (eg. the Common User Lands Working Group).</p>
<p>Catchment management processes</p> <p>Mitchell River Watershed Fitzroy Basin Regional Strategy Herbert, Mary and Johnstone rivers Lake Eyre Basin</p>	<p>Usually established through community initiative.</p> <p>Focus on establishing integrated approaches to natural resource management within the catchment.</p> <p>Usually sponsored by a catchment coordinating group and supported through Department of Natural Resources and other program funds.</p> <p>Usually result in catchment management strategies and implementation monitored by the group.</p>
<p>Regional social infrastructure planning</p> <p>Mackay Regional Council for Social Development Human Services Integration Project Central Western Queensland Rationalisation Exercise</p>	<p>Usually established because of need to provide greater social infrastructure with limited resources.</p> <p>Can be driven by State, Federal, local government or community sector.</p> <p>Focus is often on regional needs assessment, regional service delivery and coordination.</p> <p>Variety of forms include coordinative groups, regional councils, VROCs.</p> <p>Usually highly participative processes.</p> <p>Often result in regional social plan or service delivery plans, or simply provide social planning input into other processes.</p> <p>Implementation monitored by established structures.</p>

INSTITUTIONAL ARRANGEMENT	CHARACTERISTICS OF THE RESULTANT PLANNING PROCESSES
<p>R&D regional planning processes</p> <p>CSIRO/LWRRDC</p>	<p>Driven by need for more sustainable land resource management.</p> <p>Driven by R&D corporation and CSIRO.</p> <p>Will focus on sustainable and equitable land management .</p> <p>Will seek to empower stakeholder groups to plan and to negotiate regional strategies with other stakeholders.</p> <p>Will focus on negotiating regional solutions to key resource use problems.</p> <p>Process recently commenced.</p>
Institutional arrangements for regional resource use planning in South Australia	
<p>Regional reviews</p> <p>Barossa Valley Review Mt Lofty Ranges Review</p>	<p>Needs arose from the impacts of rapid urban growth and development in environmentally sensitive and agriculturally important regions.</p> <p>Barossa Valley instigated by five local authorities and had strong ownership from local government.</p> <p>Mt Lofty Ranges sponsored by State government.</p>
<p>Other relevant programs/ processes</p>	<p>VROC or REDO driven processes.</p> <p>Catchment management processes.</p> <p>Regional groundwater planning.</p> <p>Protected area planning.</p> <p>Coastal management planning.</p> <p>Health and social welfare councils.</p>
Institutional arrangements for regional resource use planning in Western Australia	
<p>World Heritage planning</p> <p>Shark Bay</p>	<p>Need for regional approach established by World Heritage listing.</p> <p>Focus on management of the World Heritage values of the regions.</p> <p>See Table 5 for legislative and administrative basis.</p>
<p>WA Planning Commission regional strategies and plans</p> <p>Bunbury 2000 (1983) Great Southern (1987) Shark Bay (1987) Leeuwin-Naturaliste Regional Plan (1987) Geraldton Mid-West Region Strat. (1988) Kwinana Regional Strategy (1988) Peel-Harvey Estuary (1989) Central Coast Regional Strategy (1994) Peel Regional Strategy (1994) Goldfields Esperance (1990) Metroplan (1990) Albany Regional Strategy (1994) Freemantle Regional Strategy (1994) Gascoyne Coast Regional Strat. (1996) Pilbara (1992)</p>	<p>Needs have arisen for a variety of regional economic development, environmental protection and growth management reasons.</p> <p>Focus is usually to establish a statutory land use planning regulatory document with associated operational strategies.</p> <p>Statutory basis provided by the <i>State Planning Commission Act 1985</i>.</p> <p>Processes centrally driven by the State Planning Commission and often undertaken by appointed consultants with direction from steering committees.</p> <p>Steering committees rarely include community sector, but often include regional development commissions, industry and local government.</p> <p>Strategies underpinned by regional planning studies.</p> <p>Often seek to deal with service efficiencies, physical infrastructure and environmental considerations.</p> <p>Often statutory and administrative frameworks for public review applied.</p> <p>Tend to result in regional frameworks for growth management and regulatory zoning maps and operational strategies.</p> <p>Regional strategies to be incorporated in new planning schemes by town and shire councils and by landowners.</p> <p><u>Joint Department of Urban Development and town/shire monitoring programs</u></p>
<p>Joint DRDN/DPAUD regional plans</p> <p>Kimberley Region Plan</p>	<p>Need arose because of: rapid tourism, mining and agricultural growth in a remote region; important historical, environmental, social and cultural values; significance as an Aboriginal domain.</p> <p>Focus on conflicting land use perspectives and regional development.</p> <p>Based on community workshops and run jointly by the two departments.</p> <p>Resulted in a formal strategic land use and operational plans.</p> <p>Kimberley Development Advisory Committee and Kimberley Region Plan Committee to oversee implementation and monitoring.</p>

INSTITUTIONAL ARRANGEMENT	CHARACTERISTICS OF THE RESULTANT PLANNING PROCESSES
<p>Regional management plans</p> <p>11 CALM Regions</p>	<p>Need established under the <i>Conservation and Land Management Act</i>. Focus on planning for the conservation and resource potential of Crown lands in 11 administrative regions. Plans generally establish a range of management objectives and principles, summarise proposed operations, promote the achievement of the purpose for which the land was vested and pursue particular objectives for each category of land. Plans include a purpose and background, resource information base, management problems and options, and management proposals (including implementation and monitoring). Plans are open to public comment for a minimum of two months before submission to government. Plans generally have a ten-year time frame, though policy review is flexible within this period. More detailed management plans are prepared in addition to the regional plan for certain high value or high conflict areas.</p>
<p>University-driven projects</p> <p>East Kimberley Impact Assessment Project</p>	<p>Evolved because of increasing resource development pressures in an Aboriginal domain, declines in non-Aboriginal pastoralism and increases in Aboriginal land ownership. A joint project of the Centre for Resource and Environmental Studies at the Australian National University, the Australian Institute of Aboriginal Studies, the Anthropology Department of the University of Western Australia and the Academy of Social Sciences in Australia. Project constituted a long term demographic and ethnographic study of the Aboriginal population of the East Kimberley and was largely conducted in association with Aboriginal communities in the region. Project resulted in a range of multidisciplinary research studies. Project studies were intended to empower Aboriginal communities to negotiate better outcomes over a range of regionally significant issues.</p>
<p>R&D regional planning processes</p> <p>Rangeways Project</p>	<p>Driven by need for more sustainable land resource management. Driven by R&D corporation and Department of Agriculture, but involving REDO, community and industry sectors. Will focus on need for changing to sustainable forms of land use after assessing social, economic and environmental opportunity costs. Will explore procedures for regional land use planning that are consistent with ESD and integrate social, economic and environmental issues. Hopes to explore stakeholder and community participation as well as political, institutional, market and fiscal intervention required to implement desired land use allocations. Will seek to empower stakeholder groups to plan and to negotiate regional strategies with other stakeholders via establishment of participative planning committee, data collection and using LUPIS to assess land use allocations within negotiated guidelines. Only recently commenced</p>

INSTITUTIONAL ARRANGEMENT	CHARACTERISTICS OF THE RESULTANT PLANNING PROCESSES
<p>Action Research Project</p> <p>South Coast</p>	<p>The aim of the exercise is to develop a better understanding of sustainable management of the region.</p> <p>Initiated by the Department of Agriculture with a period of consultation to measure community landcare and environmental concerns.</p> <p>High degree of collaboration between government departments and the community sector in moves towards sustainable regional development</p> <p>Substantial input from government agencies such as CALM, the Water and Rivers Commission, the Department of Environmental Protection, local shires and the Great Southern Development Commission.</p> <p>Process resulted in a series of six Land and Water Care Strategies.</p>
<p>Other relevant programs/ processes</p>	<p>VROC or REDO driven processes are often supported by the new Regional Development portfolio to undertake economic planning, project promotion and education, research, professional support and information exchange.</p> <p>Statutory regional development commissions supported by the Regional Development portfolio in the same way as VROCs and REDOS.</p> <p>Catchment management processes and regional groundwater planning.</p> <p>Protected area planning.</p> <p>Coastal management planning policies being developed by the State Planning Commission under a memorandum of understanding.</p> <p>Environmental Protection Agency is encouraging regional environmental investigations as part of their sustainable development of rangelands position paper (EPA 1996).</p>
<p>Institutional arrangements for regional resource use planning in the Northern Territory</p>	
<p>Regional structure plans</p> <p>Darwin Regional Structure Plan 1990</p> <p>Gulf Region Land Use and Development Study</p>	<p>Published and developed by the Department of Lands and Housing in Accordance with Section 66A(1) of the NT <i>Planning Act</i>.</p> <p>Establishes a broad land use structure for the future development and key land use development proposals.</p> <p>Based on detailed regional profiles of the natural and social environment and details existing land use.</p> <p>Statutory forms of public review available, but plan developed by DLH.</p> <p>Broadly integrates economic, physical and environmental considerations.</p> <p>Structure plan overlies town and community government planning and provides basis for regulation of development in region for private sector and public sector developers.</p>
<p>Other relevant programs/ processes</p>	<p>World Heritage Area planning (Kakadu and Uluru).</p> <p>VROC or REDO-driven processes.</p> <p>Catchment management processes and regional groundwater planning.</p> <p>Protected area planning.</p> <p>Coastal management planning.</p>

INSTITUTIONAL ARRANGEMENT	CHARACTERISTICS OF THE RESULTANT PLANNING PROCESSES
Institutional arrangements for regional resource use planning in New South Wales	
<p>Regional strategies</p> <p>North Coast Urban Planning Strategy. Hunter Coastal Urban Settlement Strategy. Metropolitan Strategy. Draft Illawarra Coast Planning Strategy. Draft Sydney– Canberra Corridor Strategy. ACT and Subregion Planning Strategy. Albury Wodonga Regional Planning Strategy.</p>	<p>Section 117(2) of the <i>Environment Planning and Assessment Act</i> provides for the Minister to give direction to councils in relation to particular (in some cases regional) planning issues. Establishes a broad land use structure and guidelines for future development and key land use development proposals. Statutory public review. Plan developed by NSW Department of Planning in association with other agencies and local government. Broadly integrates economic, physical and environmental considerations. Resultant plan overlies local government planning.</p>
<p>Regional environmental plans</p> <p>41 in operation 11 in exhibition 6 not yet exhibited</p>	<p>Usually prepared in accordance with Sections 40 and 41 of the NSW <i>Environmental Planning and Assessment Act 1979</i>. Regional environmental plans are preceded by regional environmental studies. Work is usually undertaken by the relevant State government agencies in cooperation with other stakeholder agencies. Committees established under s22 of the Act drive the process and usually include State and local government representatives. Subcommittees generally report to the s22 committee, but seem to have limited community sector input. Specialist consultancy reports also used to inform the process. Generally undertaken to compile comprehensive social economic and environmental data, to analyse these issues and present preferred strategies for land use change (eg. accommodating growth) May integrate social, economic and environmental issues. Usually result in land use policies and operational strategies. Implementation usually through existing structures.</p>
<p>R&D regional planning processes</p> <p>CSIRO/LWRRDC Regional Project</p>	<p>Driven by need for more sustainable land resource management. Driven by R&D corporation and CSIRO. Will be run by a project management team and draw upon a stakeholder advisory network, steering committee, technical advisory group, regional planning reference group and regional rangelands projects liaison group. Hopes to establish a knowledge system to support regional planning, conservation and development initiatives. Will work with regionally-based stakeholder committees with coordinators funded by the Murray Both areas also fall within the bounds of catchment management committees and enclose a number of land care groups Aims to result in development of nationally applicable theory, principles, practices and methods for sustainable land use. Only recently commenced.</p>
<p>Other relevant programs/ processes</p>	<p>World Heritage Area planning. Resources and Conservation Assessment Committee VROC or REDO-driven processes. Catchment management processes and regional groundwater planning. Protected area planning. Coastal management planning. Area Assistance Scheme funding for regional approaches to address inequality in human services (see Jones and Thornthwaite 1994:84).</p>

Appendix 2.

Examples of Actual and Suggested Negotiated Solutions to Key Regional Resource Management Issues

Management problem	Negotiated solution	Examples/ Source
Environmental and resource use issues		
Transfer of management from marginal production to conservation management.	Financial assistance allocated to enable managers to remain on the land to assist in the management of feral animals, weeds, fire and local reserves, in exchange for certainty that any residual productive use of the land was sustainable. Negotiation of formal cooperative management regimes between Government and producers.	Moreton <i>et al.</i> (1995)
Transfer of land use from quality or marginal production to the formal conservation estate.	Negotiated property acquisition/ compensation for inclusion in the conservation estate.	SEQ2001
Transfer of management from unsustainable to sustainable production.	Reform of lease tenures, replacing development and stocking conditions with sustainable use requirements and conditions.	Holmes (1996b:34)
Direct expansion of the formal conservation estate.	Designation of unallocated land to the formal conservation estate. Specific budgetary allocations for land purchase.	WADRDN and WADPUD (1990:13)
Insufficient resources for dealing with environmental problems.	Specific budgetary allocations to enhance conservation management within the region. Negotiation of user pays arrangements for environmental management purposes.	
Lack of environmental management standards between agencies with a role in resource management.	Negotiation of environmental management standards or codes of behaviour between appropriate agencies.	WADRDN and WADPUD (1990:13)
Lack of environmental awareness across the region.	Negotiation of regional environmental awareness strategies.	WADRDN and WADPUD (1990:13)
Insufficient environmental management skills within the region	Negotiation of additional courses or modification of existing courses within the regional education and training system. Establishment of environmental management training strategies within regionally-based stakeholder involved in natural resource management.	WADRDN and WADPUD (1990:13)
Insufficient environmental standards in development approval processes within the region.	Regional agreement about performance criteria to be integrated in planning schemes and other plans which influence land use decisions. Regional agreement about criteria to be built into triggers for impact assessment for development assessment.	FNQ2010
Areas of high environmental sensitivity identified, but further planning work needed to protect environmental values and management.	Regional agreement about priority local areas and other forms of environmental management planning.	WADRDN and WADPUD (1990:13)

Management problem	Negotiated solution	Examples/ Source
<p>Areas of insufficient knowledge identified, requiring further research work to underpin future regional environmental management strategies.</p> <p>Insufficient economic incentive for conservation management.</p> <p>Protection of biodiversity.</p> <p>Inequitable land administration.</p> <p>Rural readjustment and re-establishment support.</p>	<p>Strategies negotiated to develop strategic research and development projects dealing with identified regional issues.</p> <p>Budgetary allocations at the regional level to deal with identified research and development priorities.</p> <p>Park use fees for protected areas.</p> <p>Negotiated commercial license fees.</p> <p>Indirect taxes and charges.</p> <p>Earmarking funds raised from regional economic development.</p> <p>Negotiated provision for donations.</p> <p>Performance bonds on private operators.</p> <p>Investment in conservation on private lands.</p> <p>Codes of practice negotiated for specific sectors.</p> <p>Building adequate buffer zones into regional land use plans.</p> <p>Setting broad performance criteria for land use at the regional level.</p> <p>Negotiation of relevant legislative and administrative change.</p> <p>Negotiation of regionally-based rural restructure package.</p>	<p>Preece <i>et al.</i> (1995:76)</p> <p>Ledgar (1994:73)</p> <p>Ledgar (1994:74)</p>
Social and cultural issues		
<p>Aboriginal alienation from lands in which they still hold a direct traditional, social, economic, cultural or historic interest (eg., Crown land, pastoral lands and areas already declared or to be declared part of the formal conservation estate).</p> <p>Insufficient Aboriginal access to land of traditional, historical, economic or cultural importance</p>	<p>Government development of regional strategies for expediting the land claim process and for property purchase where possible.</p> <p>Negotiation of cooperative management agreements between conservation agencies and Aboriginal groups.</p> <p>Direct negotiation of heads of agreements between Aboriginal groups and pastoralists about access agreements; bilateral access agreements reached in specific areas or on particular properties.</p> <p>Budgetary allocations to regional land purchase.</p> <p>Negotiated agreement between land managers and Aboriginal people about access and other significant concerns.</p>	<p>Cape York Land Use Agreement</p>
Economic issues		
<p>Insufficient skills base within the region to support economic growth</p> <p>Poor perception within the community regarding growth of a particular industry or group of industries</p>	<p>Negotiation of additional courses or modification of existing course within the regional education and training system.</p> <p>Establishment of industry skills and training strategies within regionally-based industries.</p> <p>Budgetary allocations and strategies to improve public awareness.</p>	<p>WARDN and WADPUD (1990:13)</p> <p>SEQ2001 FNQ2010 WARDN and WADPUD (1990:13)</p>

Management problem	Negotiated solution	Examples/ Source
Insufficient physical infrastructure to support industry growth within the region	Focused budget appropriation for regionally significant infrastructure development. Negotiated agreements between industry and government about appropriate and equitable developer contributions for physical infrastructure.	SEQ2001
Insufficient land available to cater for projected industry development within the region	Any resultant regional land use strategy adequately caters for industry expansion.	SEQ2001
Procedural issues in regional resource use planning		
More detailed sub-regional work required to implement to strategies established within the regional plan	Establishment of cross-sectoral sub-regional planning committees to report back to a body responsible for monitoring the regional planning process.	SEQ2001 WABDRN and WADPUD (1990:13)
Regional land use strategies may not be reflected in local planning schemes and other forms of sub-regional or local land use planning	Negotiated agreement among stakeholders about the incorporation of regional land use strategies within subordinate planning instruments or development assessment processes.	SEQ2001 FNQ2010 WABDRN and WADPUD (1990:13)

