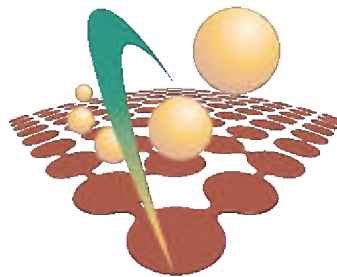


OVERVIEW REPORT

Agriculture and Natural Resource Management
in the Murray-Darling Basin:

A Policy History and Analysis

Report to the Murray-Darling Basin Commission



INSTITUTE FOR **Rural Futures**



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Ian Reeve
Institute for Rural
Futures

Lionel Frost
School of Business
La Trobe University

Warren Musgrave
Economic Consultant

Richard Stayner
Institute for Rural
Futures

**Institute for Rural Futures
University of New England
Armidale, NSW 2351**

Tel: 02 6773 2220
Fax: 02 6773 3245
Email: irf@metz.une.edu.au
Web: <http://www.ruralfutures.une.edu.au>



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Preface

Government policy for agriculture and natural resource management (NRM) has a profound influence on the ways in which natural resources are utilised. There is broad acknowledgment that agriculture will have to be practised differently from now on, in order to reverse the trend towards environmental degradation in many parts of the Basin. There is a need for new policy directions, especially considering the urgent need to address dryland salinity and related issues.

This report is part of a project instigated by the Human Dimension Program of the Murray-Darling Basin Commission and was undertaken by the Institute of Rural Futures based at the University of New England in NSW.

The project initially produced an Overview Report which is a description of the broad trends in 20th century government policy which impacted on land use practice in the Basin. A Workshop was then held to debate and agree upon the four most significant areas where a shift in policy could, in the long term, encourage and facilitate sustainable farming practices. Each of these four areas is the subject of an issues discussion paper. These papers are designed to be a broad canvassing of ideas which will contribute to the debate about the direction NRM will take in the future. Authors were asked for suggestions to move the agenda forward, and the ideas contained in the papers are not necessarily endorsed by the Commission.

<i>Overview Report:</i>	Agriculture and Natural Resource Management in the Murray-Darling Basin – A Policy History and Analysis
<i>Issues Paper 1:</i>	Legal Issues Relating to Water Use
<i>Issues Paper 2:</i>	Resource Governance and Integrated Catchment Management
<i>Issues Paper 3:</i>	Regional Development Issues
<i>Issues Paper 4:</i>	Human Dimensions of Structural Change

Please note that these are a linked set of documents and are fully referenced in the bibliography at the end of each component report.

Acknowledgments

Each of the papers has been reviewed by one or more external reviewers, as well as by the members of the project Steering Committee. The papers have gained significantly from the helpful comments and suggestions provided by these reviewers and their assistance is gratefully acknowledged.

Summary

This overview report forms the first part of project MP 2004: *Agricultural and natural resource management in the Murray-Darling Basin: a policy history and analysis*.

The greater part of the report is a description of the broad trends over the 20th century in trade and industry policy, farm policy and water resources and land resources policy in the Basin, taking in both Commonwealth policy and the policies of the State Governments of Queensland, New South Wales, Victoria and South Australia.

The history of agricultural and natural resource management policy in the Murray-Darling Basin falls into two eras, separated by what might be termed a policy watershed in the late 1960s and early 1970s. During the first six decades of the 20th century, policy was underpinned by the assumption that the expansion of agriculture and the settlement of the Basin and other inland regions was essential if the nation was to prosper. With this unquestioned assumption, the natural corollary was significant government intervention in commodity and land markets, and massive government investment in water and transport infrastructure, and in agricultural and soil conservation extension services.

The policy watershed of the late 1960s and early 1970s ushered in the second era of policy making. Tariff protection began to

be dismantled, Australia lost its preferential treatment in British markets, and industry efficiency and global competitiveness replaced nation-building as the rationale for both water and farm policy. However, while farm and water policy, and public policy more generally, were characterised by the withdrawal of the involvement of governments in the provision of services to agriculture, there was growing government involvement in areas such as catchment planning and the administration of landcare.

The policy watershed of the late 1960s and early 1970s also marks the beginning of a period of greater diversity and experimentation in agricultural and resource management policy in the Basin. Most visible among the policy experimentation has been the COAG water reforms and landcare programs which, respectively, brought cooperative federalism and group extension to new heights in water and land resource management policy.

However, there is still an urgent need for further policy experimentation as the forces of globalisation and structural change continue to place pressure on the viability of many farms in the Basin, and as the environmental legacies of past policy initiatives and omissions continue to transform the landscape. The companion issues papers to this report discuss this in greater detail.

1 Background

1.1 The Human Dimension Strategy

The Murray-Darling Basin Initiative has been established to give effect to the Murray-Darling Basin Agreement between the Commonwealth Government and the Governments of South Australia, Victoria, New South Wales, ACT and Queensland. The aim of the Agreement is: 'to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin'.

It has been recognised at an early stage that effective natural resource management will require a deeper understanding of its human dimensions. To this end, the Human Dimension Strategy was approved by the Commission in November 1999. The Implementation Plan for the Human Dimension Strategy recognises that changes will be required to organisational cultures within the partner Governments. To this end the Plan adopts a learning organisation model, an important aspect of which is that organisations should learn from their own experiences and history. The Plan has a number of foci, one of which is knowledge generation, dissemination and adoption.

This is being achieved through a suite of research projects within the Strategic Investigations and Education (SI&E) Program. One of these research projects (MP 2004) deals with the history of agricultural and natural resource management policy in the Basin. It will contribute to organisational learning within the partner Governments, as well as

addressing other priority areas within the programs of the Murray-Darling Basin Commission. These areas include the provision of contextual frameworks to validate policy directions, and improving the understanding of key socio-economic factors that influence the ecologically sustainable development of the Murray-Darling Basin.

1.2 The project objectives

This overview report forms the first part of project MP 2004: *Agricultural and natural resource management in the Murray-Darling Basin: a policy history and analysis*.

The aim of the project is to 'identify the drivers of past policy and the impacts of this policy on land use practice in the Basin'.

Specifically, the project objectives are:

- to identify the drivers of past agricultural and natural resource management policy among the partner governments of the Initiative;
- to identify in broad terms the impact of that policy on land use practice;
- to match historic policy trends to specific land use issues; and
- to identify appropriate new policy directions to facilitate the development and adoption of sustainable farming practice.

2 Scope of the Report

2.1 What is meant by policy

2.1.1 Definition

Public policy is a course of action taken by a government for the purpose of achieving a particular goal. Government inaction or non-decision, when consistently pursued over time against pressures to the contrary, can also be regarded as policy. Both forms of public policy are given consideration in this report. The term 'policy' is used both for intended courses of action proposed by political parties seeking government, and for courses of action actually taken by governments. This report is concerned with the latter¹.

Where public policy involves government action, this may involve one or more of the following policy instruments²:

- direct regulation, including mandated self-regulation, such as when governments require industries to establish and monitor standards of performance,
- voluntarism, in which governments take a facilitating or co-ordinating role and enter into voluntary agreements with individuals, firms or organisations, and where there may be subtle rather than explicit incentives for compliance,
- education and moral suasion,
- provision, by which governments themselves undertake all the actions necessary to achieve a particular goal,
- economic instruments, including the creation of property rights and markets, fiscal instruments such as taxes and subsidies that aim to bring about the desired behaviour by affecting prices; financial instruments such as revolving funds and interest rate subsidies; the imposition of civil liability for the consequences of behaviours that governments wish to constrain, performance bonds; and the removal of perverse incentives.

2.1.2 Processes and institutions

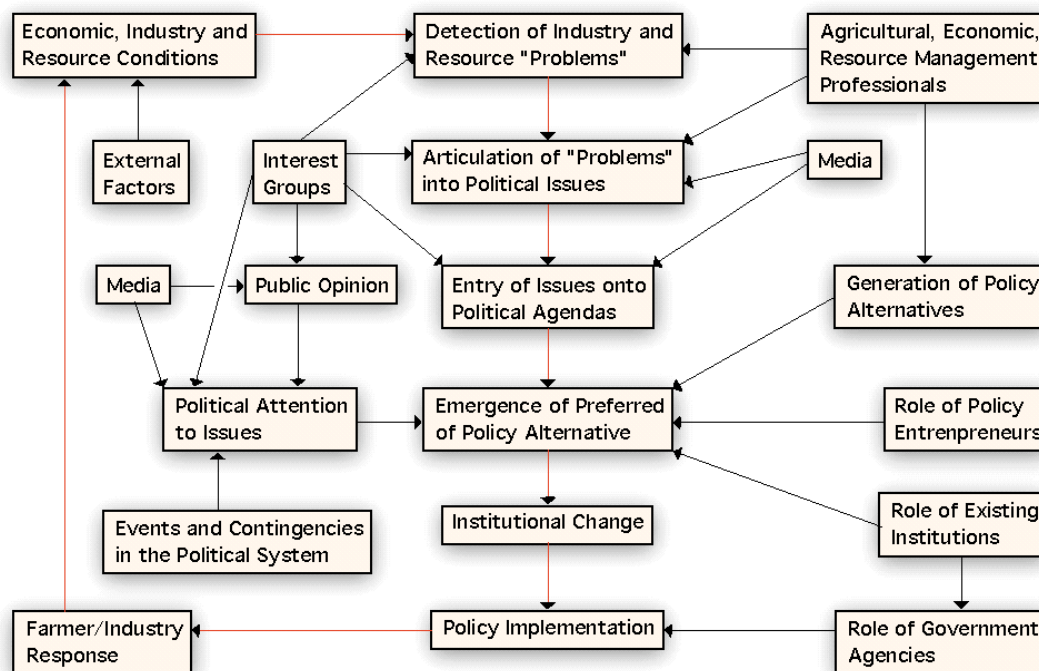
There is, however, more to an understanding of policy than the relative merits of policy instruments. Policies have impacts on social and economic conditions, new issues emerge and policies change over time. From an historical perspective, policy processes are important in explaining how changes in policy occur. Among the influences on policy processes are specific organisations and groups of people, such as government agencies, interest groups, professionals and the media. There are also less easily defined influences, such as institutions, ideologies and culture. Figure 2.1 sketches some of the relationships among these influences on the evolution of agricultural and resource management policy.

2.2 Policy areas included in the report

Almost all public policy pursued by the partner Governments will have some influence upon land use within the Murray-Darling Basin, and consequently upon environmental quality and the sustainability of agriculture in the Basin.

Any attempt to identify the forces driving agricultural and natural resource management policy must start with a consideration of public policy generally, and basic institutional foundations such as the Australian Constitution, before moving to a closer examination of agricultural and natural resource management policy. This is reflected in the following chapters, which move from a general consideration of public policy in Australia in the 20th century to macro-economic and trade policy, to farm policy and finally to water and land resource management policy.

Figure 2.1 Influences on policy processes³. The red arrows define the broad phases in cycles of policy evolution: cyclical emergence of policy-relevant problems due to changes in economic, agricultural and natural resource conditions; the movement towards a policy response and subsequent institutional change; and policy implementation and its impacts on economic, agricultural and natural resource conditions. These conditions are also influenced by factors external to the agricultural economy and ecosystems of the Basin (top left). The policy process is represented by the central column and the connecting red arrows, while the broad influences on the policy process are grouped either side of the central column. These include the role of scientific knowledge (top right), of existing institutional and administrative arrangements (bottom right) and of political processes (centre left). In recent decades, the media (centre left and top right) has played an increasingly important role both in the articulation of issues and in the interactions between public opinion and political attention to these issues.



3 Context: The Land and the Nation

An enduring theme in the European history of Australia is the adaptation of society and the economy, and of the very culture of the nation to the physical conditions of the continent. Like the cabbage tree hat, old ideas and new means were blended together to deal with the exigencies of an environment vastly different from that of Europe. Agricultural and natural resource management policy-making were an important part of this adaptation, but were not conducted in isolation from public policy-making more generally or, in the case of the latter, in isolation from environmental policy-making. This section provides an overview of the environmental differences relevant to this study, before turning to a brief contextual account of the history of public policy and environmental policy in Australia.

3.1 Australia is Different

While the British settlers arriving in 1788 could see that the land was different from Great Britain, their understanding of agriculture could not provide any guide as to whether this difference required adaptation on their part and, if so, what sort of adaptation was needed. The agricultural settlement of the Murray-Darling Basin, and Australia as a whole, was inevitably an experiment. Two hundred years of experimentation have yielded some important lessons, and lessons are still being learnt.

3.1.1 Australian soils are different

As Flannery (1994) has described, the Australian landscape carries the imprint of over 80 million years of geological quiescence, during which nutrients have been leached and soil constituents redistributed to form generally infertile soils with great contrasts in their physical characteristics. In contrast, the soils of Europe have been exposed only to some ten thousand years of soil-forming processes after the retreat of the Pleistocene ice sheets. These soils are more homogeneous in their physical characteristics and more fertile.

This difference provided the conditions for immediate agricultural failures in the first

decades of European settlement. However, it has taken two hundred years of settlement and agricultural experimentation for a much more significant difference to be appreciated. In Europe, human settlement followed the retreat of the ice sheets, with human disturbance replacing the geological disturbance of glaciation. The result was ecosystems that coevolved with disturbance and agriculture. Flora and fauna adapted to the disturbance and pulsing of nutrient flows that are inevitable in agricultural landscapes.

By contrast, in Australia agriculture was imposed on ecosystems that had taken tens of millions of years to adapt to the low nutrient status and erratic climate, and developed a biodiversity and a concentration of endemic species many times richer than that of Europe. The inherent 'leakiness' of European agriculture with respect to water and nutrients has been inimical to this rich and unique biota, as well as causing the major landscape readjustment processes that we currently understand as land degradation⁴.

3.1.2 Australian hydrology is different

In terms of its continental average rainfall, Australia is a dry continent, although because of its low population density, the

available water per capita is not low in comparison with other countries. A more useful characterisation of Australia's situation is that much of the continent's water is in the wrong place, or arrives at the wrong time (Smith 1998). What is not so widely understood, is that Australia's rainfall is unpredictable, has a high seasonal variability and a high frequency of droughts and floods (McMahon et al. 1992; State of the Environment Advisory Council 1996). The variability of annual runoff and precipitation relative to the long term averages are respectively two to four times than that of countries of similar latitude and climatic zones. Variability is estimated to be greater than that of any other continental region, and about twice that of Europe (McMahon et al. 1992, Smith 1998).

This extreme variability has profound implications for the economics of water resource development. In brief, it means that, to be viable, any level of development requires considerably greater provision for storage than is the general experience in the Northern Hemisphere. Smith (1998) claims that, for a given level of supply security, Australian dam storage capacities need to be twice that of the world mean and six times that of Europe. This has serious implications for the economics of water resource development. A further implication is that, for a given level of supply security, the disruption of natural river functions, following the construction of storages and other infrastructure, is also likely to be greater in Australia.

3.2 Public Policy⁵

As a result of the expansion of mining and pastoralism during the 19th century, the Australian economy at the time of Federation was based on the export of raw commodities. While other small economies had no choice but to favour open international markets, Australia's wealth of natural resources and political circumstances made it possible to institute a system of tariffs to protect its

domestically orientated manufacturing industry (Castles, 1988).

The public policy initiatives upon which this domestic defence were built had their origins in the alliance between protectionist Liberals (under Alfred Deakin) and the Labor Party in the first decade after Federation. Australia was relatively advanced in the development of the Labor movement because of the conditions in its mining and pastoral industries. This political alliance was a manifestation of what Kelly (1992) termed the 'Australian Settlement' — the mutually beneficial policies of the White Australia policy that protected Australian workers against cheap immigrant labour, domestic tariffs to protect the emerging manufacturing sector, industrial arbitration to protect workers' conditions, state paternalism to protect citizens against the exigencies of life in a newly settled country, and imperial benevolence on the part of Britain to protect the fledgling nation against foreign threats.

By 1910, Australia was comparable to the Scandinavian countries (also small resource rich economies) in its progressive social policies, but differing fundamentally in that workers were protected by the 'Australian Settlement', rather than the comprehensive welfare state that emerged in the Scandinavian countries.

As the strategy of domestic defence became institutionalised in the period between World Wars I and II, and changes in the political landscape resulted in Commonwealth Governments that were coalitions between the Nationalists and the Country Party, the policy of tariff protection remained despite the earlier support for free trade among rural interests. The acquiescence to tariff protection of manufacturing by the Country Party was purchased politically with similar measures that were beneficial to rural interests, such as tariff protection for domestic foodstuffs, bounties on production and irrigation subsidies (a policy framework that has been termed

‘protection all round’). The extensive involvement of State and Commonwealth Governments in infrastructure development such as irrigation was both an economic necessity in a recently settled country short of capital, and a political necessity to placate rural interests which, nonetheless bore much of the costs of protection of manufacturing industry — amounting to a transfer of wealth from the prosperous rural sector to the threatened manufacturing sector.

Up until the 1930s, economic policy-making was dominated by the ideas of neo-classical economics which did not favour government intervention in national economies. With the Great Depression, the development of John Maynard Keynes’ ideas about an interventionist role for government, and the replacement of conservative governments by governments representing workers’ interests in a number of countries, economic policy-making underwent a ‘Keynesian Revolution’. In Australia, this did not occur until the Curtin Labor Government came to power during World War II.

As experience was gained with Keynesian economic management, and particularly with the post-war economic boom, conservative political parties began to accept Keynesian economics as a form of ‘hands off’ intervention that did not restrict the autonomy of private enterprise.

In Australia, the election of the Menzies Government, a coalition between the Liberal Party and the Country Party led by John McEwen, brought protectionism, state developmentism and Keynesian economic management to new heights. As other countries signed up to the General Agreement on Tariffs and Trade that had been launched by the USA in 1947, Australia continued to build tariff walls around a domestic manufacturing economy that flourished briefly during the 1950s while it served a rapidly growing population bolstered by post-war immigration and the baby boom. Adjustments to Australia’s fixed exchange rates were used as a means of protecting

agriculture from low overseas commodity prices and addressing concerns about the balance of payments.

While tariffs had come under criticism from within the Tariff Board itself as early as 1965, it was the end of the post-war boom in the early 1970s that resulted in the dismantling of Australia’s tariff protection. With stagflation a problem in many Western economies, Keynesianism lost ground to neo-classical economic orthodoxy, globalisation began to undermine the capacity of national governments for Keynesian intervention in their economies, and social and economic change weakened the coalition of interests that had made Keynesianism possible.

The Whitlam Government reduced tariffs and changed the role of the Tariff Board under the new name of the Industries Assistance Commission. After a hiatus in the dismantling of protection during the time of the Fraser Government from 1976 to 1983, the Hawke Government floated the Australian dollar and introduced measures to deregulate the financial sector.

The worsening outlook in international markets for Australia’s commodity exports in 1985, the fall of the Australian dollar and rising current account deficits and overseas debt showed beyond all doubt that the nation could no longer rely on its primary industries to support an inefficient and uncompetitive manufacturing sector protected by tariffs. In response, the Hawke Government in the late 1980s put in place a regime of phased tariff reductions.

In public policy more generally, the last two decades of the 20th century have seen a revival of the *laissez faire* ideals of classic liberalism. The term ‘economic rationalism’ has been used widely in this connection (often in a reckless way and by groups whose interests are threatened) which fails to distinguish between ‘soft’ economic rationalism which argues that governments should leave markets to do what markets do best, and ‘hard’

economic rationalism which argues that markets can do just about everything better than governments.

The imprint of soft economic rationalism is to be seen everywhere in public policy at the close of the 20th century — manifest in reductions of government spending, corporatisation, privatisation, introduction of ‘user pays’ systems, outsourcing of government services, private sector investment in public infrastructure, industry deregulation and market creation. A further feature, some would argue, is reregulation, viz, the introduction of new forms of regulation required to remedy new forms of market failure.

3.3 Environmental Policy

Natural resource management policy falls within the broad area of public policy concerned with environmental matters. Environmental policy has become an area of study in its own right in the decades following the rise of modern environmentalism in the late 1960s. A number of historic trends can be identified (see, for example, Fisher, 1993; Doyle and Kellow, 1995; Fenna and Economou, 1998; Economou, 1999; Conacher and Conacher, 2000) that are relevant to an understanding of the history of natural resource management policy. The following account draws extensively from these sources.

The key event in the history of environmental policy was the rise of modern environmentalism in the late 1960s — a phenomenon that occurred in all Western nations. This is not to say that there was no environmental concern or environmental policy prior to this time. Rather, these concerns did not capture the political attention that many environmental issues enjoy today. In addition, public policy initiatives to deal with what would be regarded as environmental problems today were analysed and justified with relatively little reference to the concepts of environmental

science and ecology — which concepts had yet to enter public and political consciousness. The most common framing of these problems was derived from the common law concept of ‘nuisance’ — the deleterious impact of the activities of one citizen upon another. The early air and water pollution legislation of the 1950s and 1960s aimed to provide a more efficient way of dealing with nuisances than individual citizens bringing actions in common law against each other. This legislation generally attempted to provide a statutory definition of what constituted a nuisance.

However, ameliorating deleterious environmental impacts is only one part of environmental policy. Another important part is concerned with coordinating and regulating the activities of citizens and firms who wish to make commercial use of natural or mineral resources. In the period prior to the rise of modern environmentalism, this was largely achieved through institutions founded upon property rights. For most of the 19th and 20th century it has been held that the reception of common law in Australia from the United Kingdom invested in the Crown, and subsequently in the State legislatures, absolute ownership of all land and land-related resources⁶. Access was granted by the Crown or Ministers of the Crown by such means as freehold title, leasehold tenures, and various licences and leases to take timber, fish, or explore for and extract minerals. With the exception of freehold title, these leases and licences generally allowed governments considerable latitude in exercising control over the holders of them, although much of this control was directed at promoting development rather than protecting the environment. In some cases, such as for leasehold tenures, the actual amount of control exercised by governments compared to the potential available to them was relatively small.

While there were many scientists and other interest groups who raised concerns about environmental problems during the first half of the 20th century (see, for

example, Powell, 1993 or the account of the history of the Australian environmental movements by Hutton and Connors, 1999), rarely was it suggested that governments did not have the means to deal with these problems. The key aspect of the rise of modern environmentalism in the late 1960s was that the four pillars of early 20th century environmental policy — common law nuisance, statutory nuisance, absolute ownership by the state of unalienated lands and resources, and property rights granted by the state — came under criticism as part of the problem rather than the means to a solution. This period spawned a number of social movements in addition to the environmental movement (for example, anti-nuclear, anti-war and women's and gay rights movements), all of which demanded radical changes to the political, economic and social institutions of the day, including increased public consultation and participation in government decisions affecting the environment.

While governments did not accede to all the demands that were made in the late 1960s and early 1970s, there has nevertheless been an enormous increase in the diversity of environmental issues that have received serious political attention, and in the diversity of policy responses. A number of trends over the last two decades of the 20th century can be identified.

Firstly, a number of the institutional arrangements for public participation in environmental decision-making have been partly dismantled since the heyday of public participation in the 1970s,⁷ although it should be noted that land resource management is an environmental policy domain that has gone against this trend⁸.

Secondly, as in most Western countries, there has been extensive institutionalisation of science in dealing with environmental conflicts. The first step in this process was the concept of environmental impact statements and statutory requirements for such statements

as part of development approval. Also at an early stage, environmental considerations were readily absorbed into the practice of urban and regional planning which, as a professional discipline, had been in existence for several decades prior to the rise of modern environmentalism.

A further aspect of the institutionalisation of science has been the attempts by governments to shift political conflicts over the environment and development out of the political sphere by setting up instrumentalities or procedures whose role would be to resolve the conflict by neutral scientific analysis (for example, the Australian Heritage Commission, the Resources Assessment Commission and Regional Forestry Agreements). At the Commonwealth level, and in part necessitated by the residual powers of the States under the Constitution over land and water policy, this reached its zenith during the term of the Hawke Government and since that time there has been considerable devolution of procedural resolution of environmental conflicts to the States.

Allied to this has been the trend towards merging government departments with environmental responsibilities. The separate departments that had emerged during the late 19th and 20th centuries were appropriate to the task of transferring the land and resources in government ownership to various forms of private property. However, when the environmental conflicts of the 1960s and 1970s emerged, this division of responsibility across departments embroiled Cabinets in the resolution of differences between departments. The merging of departments meant that these conflicts had to be resolved within agencies, thus relieving Ministers of the onerous burden of politically sensitive decisions likely to offend major sections of the electorate whichever choice they made.

Another trend in environmental policy over the last twenty years or so has been

the increasing involvement of the Commonwealth Government in environmental policy, part of which is a consequence of the growth in international environmental agreements. Starting with the Lake Pedder Committee of Inquiry in 1973, the Commonwealth Government has successfully used its section 51 powers to challenge and/or terminate State supported development projects (for example, Lake Pedder, the Franklin, Fraser Island, the Daintree). These actions have generally been supported by the High Court when States chose to challenge Commonwealth powers.

However, the relationship between the States and the Commonwealth in matters of environmental policy has not been solely adversarial. Another trend towards the close of the 20th century has been the growth in Commonwealth-State networks involved in consensual policy-making. The diversity of institutions includes Ministerial Councils, the ESD Working Group process, Inter-Governmental Agreements and more informal groups of government representatives. An important aspect of the strengthening of cooperative federalism that has made it possible for Commonwealth influence on

environmental policy to reach far beyond its section 51 powers is vertical fiscal imbalance — the fact that the Commonwealth raises about 70 per cent of taxation revenue in Australia, but is responsible for about 50 per cent of government expenditure. Consequently, tied grants and related means by which revenue is distributed to States enable the Commonwealth to exert considerable influence in policy matters that in the first half of the 20th century would have been regarded as the exclusive domain of the States. The introduction of the GST has exacerbated the vertical fiscal imbalance (James, 2000), with the result that the Commonwealth influence on environmental policy will continue to reach well beyond its section 51 powers.

Much of environmental policy in the last two decades of the 20th century can be seen as experimentation with, and a working through of conditions of, co-operative federalism. Given Australia's federal system of government, the division of powers in the Constitution, and the trans-boundary extent of environmental problems, this experimentation will continue to be an important part of environmental policy in the Basin.

4.1 Introduction

For the first two thirds of the 20th century, agricultural industry and trade policy has been associated with measures of assistance that are targeted towards farmers who are engaged in particular primary industries producing for domestic and overseas markets. Assistance is defined in the *Productivity Commission Act* of 1998 as ‘any government act that, directly or indirectly, assists a person to carry on a business or activity, or confers a pecuniary benefit on, or results in a pecuniary benefit accruing to, a person in respect of carrying on a business or activity’. Agricultural industry policies might benefit producers by the availability of needed infrastructure and services that are priced below their full cost, and by the disposal of government-owned land at less than the market price. Such policies have tended to be the responsibility of colonial and state governments. Trade policy centres on the degree to which the economy abides by the principles of free trade. Governments may interfere with free trade by assisting domestic producers through tariffs, quotas, anti-dumping duties, and regulatory restrictions on imported products, and tax concessions, subsidies, and price support schemes. Since Federation, trade policy has tended to be the responsibility of the commonwealth government.

If assistance is defined in that way, it is clear that farmers in the MDB have been receiving assistance since land was first made available for settlement. Colonial governments abandoned the sale of land at auction, with the price to be paid immediately in cash, by the end of the 1860s. People in all colonies could then select areas of Crown land on credit, to be repaid over several years. Governments provided railways to reduce transport costs and assisted in making water available for domestic and stock use. Governments built irrigation works and assisted local

irrigation bodies in obtaining finance for the construction of secondary works. It was thought that this would benefit many more farmers, and deliver greater economies of scale, than would have been the case had irrigation been left solely to private enterprise. Governments also attempted to assist small-scale producers through closer settlement and soldier settlement schemes.

The reasons why governments tended to provide a high and continuing level of assistance to rural producers will be examined in this section. Government investment was intended to encourage further investment by the private sector that would make it possible for rural regions to be settled more closely. The need for closer settlement was justified both on economic grounds and by belief in the tenets of Jeffersonian agrarian fundamentalism which extolled the moral virtues of a society of yeoman farmers. These policies were encouraged by a high level of demand from people who wanted farms of their own and by the strength of demand for certain primary products. The concern of government was to increase the supply of farmland by raising its average productivity. When the initial attempts at establishing irrigation schemes proved to be unsuccessful, governments attempted to make the schemes work rather than abandon them altogether. The issues that were thought to have the greatest influence over the success of irrigation – engineering, the pricing of water, the capital requirements of small-scale farmers, and the processing of output – aroused much debate, but the vision of Australia as a closely-settled, irrigated land did not. Until the 1930s the major policy emphasis was on increasing the number of farmers who were paying for irrigation water to increase the productivity of their land, even though ‘one would have expected that further

investment in irrigation would have been discouraged on economic grounds until the existing schemes demonstrated that they were capable of paying interest on the capital invested' (Davidson 1969: 74). Irrigation became 'locked in' as an active component of government policies because it was considered that its success, which was seen as crucial to Australia's future, would probably only come after a period of trial and error.

After the 1930s governments started to lose much of their enthusiasm for creating a closely settled pattern of rural land use, and became increasingly concerned with protecting the incomes of producers who were already on the land. Most economists argue that although such assistance generally provides benefits to the firms and industries that receive it, this comes at a cost to other sections of the economy. In some cases certain forms of industry support – notably for R&D – can deliver net benefits to the community. But while subsidies and price support schemes increase returns to individual producers, governments may have to cover the costs of these measures by increasing taxes and charges, cutting back on other spending, or by borrowing more. Market intervention of this nature tended to prop up inefficient producers and entrench a high cost structure in the Australian economy. By the mid-1980s the forces of globalisation had exposed the inefficiencies of industry assistance, and a wide-ranging program of economic reform was begun that led to major gains in productivity. The current policy challenge is to maintain the momentum of improvements in efficiency, while spreading the burden of adjustment more equitably across the community.

This section considers three issues. In 4.2 the general issues associated with the evolution of agricultural industry and trade policy are considered. How these issues have affected policy developments in the MDB is explored in section 4.3, while the policies that are needed to sustain recent productivity increases are examined in 4.4.

4.2 The Evolution of Industry and Trade Policy

In the years immediately after Federation, Australia developed a series of laws and institutions that would dominate political life until the 1980s. Support for ideas about the desirability of restricted immigration (the White Australia Policy), protecting and assisting industries, the basic wage and arbitration, a reliance on government for the provision of infrastructure and improvements in welfare, and the maintenance of strong ties with Britain, was bipartisan and was accepted by Conservative, Liberal, Country Party and Labour Party politicians. National unity on these issues provided the basis for what Kelly (1994) calls the 'Australian Settlement'.

For Kelly, the leading figure in the consolidation of the Australian Settlement was Alfred Deakin of the Liberal Party. Deakin's support for industry protection, which had been an established policy in Victoria since the Gold Rush, was at odds with the free trade interests that dominated in New South Wales. In the new Commonwealth, support for protection crystallised because Deakin formed a coalition of protectionists and the issue was also supported by the Labour Party, and later the Country Party. Rural interests had traditionally opposed protection of manufacturing because it increased the costs of many primary production inputs and was seen as something that lured young people from the bush to the cities. However, by the 1920s the Country Party, under the adroit leadership of Earle Page, had agreed to support manufacturing protection in return for assistance to rural producers, in the form of marketing organisations, subsidies, and price support schemes.

This protection for both the urban and rural sectors of the economy became known as 'Protection All Round'. The term is somewhat misleading: it does not mean that all industries enjoyed a uniform level of protection. Protection levels fluctuated over time and across industries,

as individual industries sought to advance their own interests. As Butlin, Barnard & Pincus (1982: 74) note, the essence of Protection All Round was ‘in the accommodation of conflicting interests rather than merely the permissive use of regulatory agencies for the interests of specially affected interests’. The philosophy reached a peak in the 1950s and 1960s, due to the political strength of the minister for agriculture, trade and commerce, Sir John McEwen. By the 1970s Australia had one of the highest levels of manufacturing protection in the world.

The major burden of protection fell on the efficient export sector – chiefly wool, wheat, and minerals – by raising its production costs. Heavily protected industries had an incentive to produce mostly for the domestic market. In times of economic growth, when conditions in the world economy and growing conditions in Australia favoured primary exporters, protection did not impinge unduly on Australian living standards. The efficient sectors of the economy could afford to carry the burden of protected manufacturers and small-scale rural producers, the smaller markets and higher labour costs that resulted from restricted immigration, and the cost pressures of regulated labour markets. But in times of slower productivity growth and less favourable conditions in overseas markets, protection in one industry was likely to lead to losses in others. Protection All Round was one of the weak spots in the Australian economy that made it vulnerable to high rates of unemployment during the Great Depression (Butlin, Barnard & Pincus 1982: 75).

The Australian Settlement was concerned with the distribution, rather than the generation, of national income. In good times the Australian economy never reached its full potential; in difficult times the economy was sluggish and slow to respond to challenges. During the 1980s

globalisation – the international mobility of labour, finance and capital – highlighted these defects. In a globalised economy, in which international investors and financial markets could continuously reassess the flexibility and cost structure of the Australian economy, it became increasingly costly to continue providing the ‘cosseting and caring’ trade and industry policies of the Australian Settlement. In the face of declining commodity prices (a global trend since World War I, broken only by the post-World War II boom), the primary export sector became less able to carry the burden of protection.

The theoretical foundations for the new policy and institutional framework to replace the Australian Settlement was economic rationalism. From the mid-1980s onwards, a concern for ‘getting the fundamentals right’ and ‘creating competitive capability’ replaced the traditional ‘getting the prices right’ focus of governments. The so-called National Competition Policy targeted improvements in workforce and management skills, and the creation of ‘best practice’ in the provision of hard and soft infrastructure. Within this policy framework, and despite the apparent inconsistency with the principles of economic rationalism, industry policies have persisted – having evolved to encompass enhancement initiatives rather than barrier protection (Withers and Wanna 2000). Competition policies have led to painful shakeouts and re-allocations of resources, but the result was major productivity gains during the 1990s: Australia’s rate of multi-factor productivity growth, which averaged 1.4 per cent per annum since 1964-5, increased to 2.4 per cent from 1993-4 to 1997-8. During the 1980s and 1990s, Australia’s productivity growth went from being half the OECD average to double the OECD average (Productivity Commission 1999a: 65; 1999b: 246).

4.3 The Impact of General Policy Trends on Economic Activity in the MDBC

4.3.1 *The changed world economy*

The major patterns of land use and infrastructure provision in the MDB were set in place during what historian Eric Hobsbawm (1994) calls ‘the long nineteenth century’. This was the period from the 1780s to 1914 when the Industrial Revolution spread from Britain to other parts of the world and a world economy emerged based on the exchange of goods manufactured by industrial nations for the food and raw materials produced by newly settled regions such as Australia and the Americas. World demand for primary production was directly linked to the growth of world manufacturing production. Australia became a rural exporter, transforming native vegetation into pastoral runs and farmland for the production of wool and food at the same time that the British economy was transforming its methods of producing textiles and increasing its urban population rapidly. The link between the world’s primary producing and industrial regions was one of mutual dependence. As more countries industrialised, the trend was for primary product prices to remain favourable, which enabled societies of recent white settlement to import capital from Europe. It was assumed that world demand for primary products would remain at a high level. As Sir Isaac Isaacs wrote in 1901, ‘the multiplication of mouths to be filled is inevitable and indefinite’ (Isaacs 1901: 11).

During what Hobsbawm calls ‘The Short Twentieth Century’ (from World War I to the collapse of the Soviet Union in 1991), conditions in the international economy have impinged on the economic fortunes of Australian farmers. The world’s primary production and industrial sectors, intimately linked in the long nineteenth century, became ‘uncoupled’ during this period as global agricultural output increased faster than demand (Drucker 1986). After World War I, it became

apparent that the former certainty about high primary product prices could not be maintained. European manufacturers struggled to break back into their old markets, many of which had been lost to the United States and Japan. In the 1920s a great expansion of world food production, much of it coming from North America, had depressed food prices. There was also a general decline in the proportion of income spent on food.

While irrigation schemes were generally conceived, designed, and set in concrete during a period of optimism, for much of the subsequent period producers have had to cope with oversupplied markets and rising production costs. As early as the 1920s farmers in the MDB began to look to their parliamentary representatives to stabilise marketing operations and help alleviate their debt burden.

4.3.2 *An inelastic supply of farm land*

Before World War II, many people in Australia, and in other parts of the world, associated wealth, security, and freedom with land. Amongst people who worked for others, in city factories or as farm labourers, there was a strong demand to own a farm of one’s own. The formulation of policies to provide ordinary people with access to land, which in earlier periods had been tied up in large estates, was one of the most important outcomes of the Gold Rush. Even people who had no interest in farming personally wanted the rural population to increase, as farmers were a major source of tax revenue (through land sales, customs duties, and railway revenue) and cheap food contributed substantially to high living standards. The desirability of providing a farm to everyone who wanted one was an article of faith for most Australians, and their colonial governments.

While the demand for farmland was consistently high, the supply of farmland remained inelastic (in other words, the supply of land did not increase as fast as

the market price that people were willing to pay for it). Much of the continent was of no productive use. The grasslands of the MDB were dry and lacking in fertility. Timbered areas did not have these drawbacks, but it took what seemed to be a lifetime to clear them. The supply of land could only be increased by technological change that allowed land to be cleared or cultivated more easily, by good seasons of rainfall that saturated and softened the soil, or by governments subsidising the sale of land by making it available at less than the market price. When any of these things happened, the increased supply of farmland resulted in a rapid shift of the margin of settlement, but also created a fresh set of problems. Thus when above average rainfall encouraged settlers to move to South Australia's northern areas in the 1870s, the return of normal dry conditions in the early 1880s left many farmers in a precarious position, as Meinig's (1962) classic study shows. There was a similar situation on Victoria's northern plains: settlement boomed in the 1870s because of liberal land laws (that allowed people to take up 320 acres on credit), good rainfall, and the use of a South Australian invention, the stripper harvester. By the early 1880s, however, a run of dry seasons had set in and the fertility of the soil was starting to give out. Having encouraged people to take up land, the Victorian government now faced the problem of how to keep them on it.

One solution, which was to have a major impact on the economy and environment of the Basin, was the development of irrigation. From the mid-19th century to well into the 20th century, irrigation was seen as a means to settling greater numbers of people on the land⁹. This was part of the overriding theme of Australian agricultural industry policies before the 1930s — the belief that government policies could increase the supply of farmland and make it possible for greater numbers of families to be able to make a living from the land. As the editor of the *Age* (20 July 1906) put it: 'we want our cultivable land to be more thoroughly and intensely worked, so that a small farm will

yield the young producer as good a living as the larger areas of our early days gave his father'. In fact, the reverse happened. Wheat growers progressively enlarged their holdings so that they could use machinery in a cost-effective way and keep sheep to supplement farm income. In the irrigation areas, falling prices and salinisation made small holdings uneconomic and this encouraged farmers to sow pastures of clover and introduced pasture species. In the closer settlement areas during the 1930s 'some leases of unsuccessful farmers in older settlements were cancelled and their lands were divided and added to neighbouring blocks to bring them up to larger living areas, which recent economic experience and problems of land management had shown to be necessary' (Rutherford 1964: 105). Although the main target of public capital formation was rural Australia, the private sector responded more substantially to investment opportunities in urban areas, especially after World War I (Sinclair 1970).

Above all, the great hope of the late 19th and early 20th century was that Australia could emulate the success of irrigation in America, where irrigation turned California's Central Valley into the most productive farming region in the world. There was a significant exchange of ideas and technology between California and Australia as both regions attempted to transform the natural environment into an idealised, garden landscape (Tyrrell 1999). But closely settled irrigated agriculture did not in the long term thrive in the US either, and the trend there was towards 'big spreads' — larger, agribusiness production units (Johnson 1993). If closer settlement did not work in America, where there were greater quantities of water, labour cheaper, and domestic markets bigger, it is in retrospect no great surprise that it did not work in Australia, either.

By the 1930s, the dream of a densely populated, irrigated Australia was not completely dead. The building of the Snowy Mountains scheme was evidence of that. But as Tyrrell puts it: the idea

‘lived on in popular imagination long after the dream of using it to build a democracy of small-scale and a landscape of gardens, farms and forests had been severely compromised’ (Tyrrell 1999: 173).

4.3.3 Assisting the industries and interfering with trade

Long before the ideal of a closely settled rural Australia had lost popular currency, Australian governments had begun interfering with free trade and assisting the producers who remained on the land. The basic framework was put in place during the 1920s (Wadham, Wilson & Wood 1957). A voluntary system of price control on butter was introduced in 1926, which paid a bounty on local prices to raise them above export prices. This was complemented by tariffs on imported butter. Price discrimination – the use of a two-price system that paid a higher price for domestic sales than for foreign ones – proved to be popular with farmers because the price elasticity of demand for food tended to be lower for domestic consumers than for foreign consumers (Edwards 1992). As a result, the higher domestic price boosted the total revenue earned by producers. This meant that the prices received by producers were kept above world prices by artificial means. Subsidies were paid to exporters of beef and canned fruit. The Australian Apple and Pear Council, formed in 1931, controlled the production and marketing of fruit. The Australian Dried Fruits Association was empowered to control marketing in that industry. The Association encouraged members to adopt new technology, notably the ‘cold dip’ method, and developed the successful ‘Sunrased’ brand. Rice, which was well suited to the heavy soils of the Murrumbidgee Irrigation Area, was encouraged by tariff protection. New South Wales established a Rice Marketing Board and a Rice-growers Association, and representatives of the two bodies conferred with government departments each year to determine the acreage that could be planted by each farmer. The Ottawa agreement of 1932 gave

Commonwealth producers preferred access to the British market.

In 1932 the Victorian government wrote off much of the debts of those families still working closer settlement and soldier settlement holdings. During the 1930s and early 1940s holders of uneconomic closer settlement and Mallee land were paid a financial incentive to walk off their properties. The land was then used to allow remaining farmers to enlarge their holdings (Rural Reconstruction Commission 1944: 72).

Supplementing these schemes was a range of general assistance measures, such as the Rural Adjustment Scheme, which provided low-cost finance for producers who could demonstrate their capacity to establish viable enterprises in the long term, various income tax concessions, and fertiliser subsidies.

These developments proved to have a lasting impact (Butlin, Barnard & Pincus 1982: 133-8). When World War II began, the Commonwealth established wartime powers of acquisition for most commodities. The bodies that administered these powers were generally sympathetic to, and representative of, the interests of growers. The earlier development of growers’ associations and marketing bodies simplified the process. For example, compulsory pooling of wheat production for sale by the Commonwealth government was introduced during World War I, and the arrangement was resumed in 1939 with marketing in the industry being placed in the hands of the Australian Wheat Board. During the war Australia was expected to be a major rural supplier and farmers were required to increase output. This was continued in the post-war period due to the food requirements of a reconstructing Europe. During these inflationary years, the two-price policy was reversed and growers received subsidies if their production costs rose above domestic prices. For a time, world demand for primary production was high and little, if

any, thought was given to restricting the growth of output.

After the Korean War, primary produce prices fell quickly once again, and the two-price system was restored. Prices were now guaranteed to be at least equal to the cost of production, and as world prices fell to below the costs of production of less efficient farmers, the level of subsidies paid to farmers overall increased. By the early 1960s the producers of every farm commodity were enjoying higher levels of protection than had been the case in the immediate post-war years (Lewis 1967: 309). Until the mid-1960s no effort was made to restrict the growth of output. Farmers received prices that were substantially above those that would have cleared world markets and which equalled the marginal costs of inefficient growers. This locked Australian agriculture in to a high-cost structure by protecting small-scale, inefficient growers and boosting the incomes of efficient ones. As Butlin, Barnard & Pincus (1982: 136) conclude: 'The preservation of high-cost farming implied an allocation of resources to the rural sector that would not otherwise have occurred and created a major social problem of restructuring that was becoming recognised by the first half of the sixties'.

4.4 Sustaining the Gains in Productivity

The initial exploitation of the resources of the MDB was dominated by the wool industry. Wool producers required large areas of land and the use of Crown land for this purpose was permitted in return for only a nominal fee. Wool growing required little labour. The commodity was non-perishable and had a high value in relation to its bulk, which offset the high cost of land transport. A network of towns provided needed services and casual labour. After the Gold Rush, land was made more freely available for farming and techniques of dry land farming that were suited to Australian conditions were

developed gradually. These techniques required larger areas of land and farmers tended to enlarge their holdings whenever possible. As Davidson (1969) pointed out, these land-extensive methods of primary production were the most efficient means of utilising Australian resources. By contrast, the attempt to establish irrigated agriculture, which required large inputs of labour and expensive water storages, was seen by Davidson as an economically inefficient use of scarce resources.

It must seem to many people in rural and regional Australia that the ultimate aim of modern competition policies is to recreate the type of land-extensive pattern of primary production, with only large production units, that economists regard as efficient. Communities of small-scale producers and the towns that support them see economic rationalism – the core philosophy of recent agricultural industry and trade policy – as something that threatens their way of life. As one rural politician put it: 'competition policy ... acts like a giant vacuum cleaner sucking people out of the bush and putting them on the shores in the seaboard' (cited by Productivity Commission 1999a: xxiii). That a tension exists between the Australia that has benefited from globalisation and structural changes, and the parts of it that remain from earlier periods of economic growth, was reflected in the results of the 1999 Victorian state election.

A recent report by the Productivity Commission (1999a) concluded that structural changes affecting rural and regional Australia were the result of long-term global forces and technological changes that are beyond the control of governments. The Commission found competition policies had been made a scapegoat for the problems faced by rural communities¹⁰. As noted previously, the pattern of small-scale farming, and the network of country towns supporting it, was established during conditions of rising world demand for primary production that no longer apply. Small towns that grew up to provide a limited range of everyday services and products to farmers who

travelled by horse and cart over rough roads became anachronistic in the era of the motor car and improved roads. Moreover, it is often overlooked that decline in some parts of rural and regional Australia has been offset to some extent by growth in others. Many country towns have experienced substantial population growth in recent decades, especially along the coast. Other towns have grown by creating sufficient jobs to absorb surplus population from surrounding areas, especially in wheat-sheep regions where farm and small town employment opportunities are declining. Examples of the 'sponge cities' in the MDB include Mildura, Horsham, Bendigo, Albury-Wodonga, Wagga Wagga, and Dubbo. Other towns are reinventing part of their economic base with the development of niche production (such as Mudgee, an old New South Wales wool-growing town that has developed thriving wine and food processing industries, chiefly upmarket products such as olives, mustards, cheeses, and rabbits) or tourism (such as Echuca). In short, while land use in the MDB is changing, the region has a diversified base of farming, manufacturing, and service activity, and is not being emptied of people or jobs¹¹. There is every reason to believe that the successful regions of the MDB have benefited from the removal of the distorting elements of the agricultural

industry and trade policies of the Australian Settlement.

If such productivity gains are to be continued, emphasis will need to be placed on nurturing the ability of individual regions to create jobs. Productive investment will only be forthcoming if businesses have access to resources that give them the opportunity to create linkages and technological spillovers to other industries. Clearer, more complete information is needed about the strengths and weaknesses, in terms of human capital, physical resources, and infrastructure, of communities and regions. It will not be possible to do this without a 'bottom-up' decision-making process involving closer consultation between policymakers and communities. If this does not happen there is a danger that reform processes will be stalled. As Walsh points out: 'At a time when, internationally, governments are being forced to recognise that, in a globalised world, regions are increasingly more important units of competition and linkages with other national economies, Australia's regions are feeling increasingly isolated and remote from decisions that affect them, and turning inwards because they believe central governments no longer have the capacity or desire to address their needs' (Productivity Commission 1999b: 211-2).

5.1 1788-1901: Settling the Land

In the earliest days of penal settlement farming was driven by the survival imperative; namely, the need for the colony to feed itself. The scarcity of labour and capital were very evident. Plant and animal species appropriate to the tasks were also in very short supply. The most limiting factor may have been the lack of the necessary ‘human’ capital in the form of knowledge regarding how to wrest a living from the unfamiliar land and natural resource base. The first settlers learnt fairly quickly to identify the land types where agriculture and pastoralism could be practiced with success. Modifications to technology, such as the stump jump plough and the Farrer wheat varieties took longer to appear. Some would say that the knowledge for a lasting rapprochement between agriculture and the Australian environment is still far from complete.

Aspects of the earliest measures to encourage land settlement that may be worthy of further attention include:

- the granting and selling of land to military officers, free settlers, emancipist convicts, emigrants and ‘selectors’ under varying conditions, and with varying success (Davidson, 1997; Campbell and Dumsday, 1990; Shaw, 1990; Lees, 1997);
- the attempts to control pastoral expansion and to promote the more intensive use of land;
- the attempts of policy to catch up with the realities of prior occupation by grazing;
- conflicts of interest between different classes of settlers, and the attempts of policy to deal with this;
- the arrival of agrarianism, and its Australian adaptation and implications;
- the responses to the demand for land following the gold rushes; leading to

land ‘selection’ and the colonial land Acts;

- the effects of railways and on-farm technologies in altering the spatial patterns of land use; and
- the experience of major droughts, booms and slumps in land development (Shaw, 1990).

An admittedly oversimplified summary of this period might claim that ‘farm policy’ (although not then called that) was essentially focussed on the aim of, and problems associated with, settling non-indigenous people on the land. The economic success (albeit patchy) of the early squatters failed to divert authorities from visions of more intensive land use and a more densely populated rural landscape. Although there were a number of economically devastating climatic and financial shocks to the farm sector in this period, there were apparently few policy responses that attempted to ameliorate the often parlous financial and social conditions of the sector, which was left to adapt as best it could, presumably by historically high rates of farm failure and exit, or by tolerating chronic poverty.

5.2 1901-1970: Agriculture’s Role in Continuing the ‘Nation Building’

The particular meaning of nation building in the Australian context continued to have strong pioneering and agrarian overtones. The Boer War and World War I may have had important roles in incorporating elements of the ‘bush’ ethos into the Australian identity in the first quarter of the twentieth century. What is certain is that the allocation of land to returned soldiers after World War I was seen as both an appropriate reward for war service and a means of continuing the nation

building through further land settlement and farming. The inherent failings of the scheme were insufficient land, capital and knowledge (on the part of both the authorities and the farmers themselves).

Nevertheless, agriculture continued to be a major contributor to GDP and to exports, and growth of the sector was seen as a major source of future national economic growth. This growth seemed assured in the immediate post-war periods when commodity prices were generally favourable, but these were followed by depressed prices as world production recovered.

Influences on the location and condition of the farm sector during this period included:

- the removal of interstate tariff barriers
- protection for large sections of secondary industry
- the expansion of railways
- the continuation of closer ('soldier') settlement after World War I (Campbell and Dumsday, 1990)
- Government funded agricultural research, extension and education to boost farm production
- a variety of price support schemes for individual industries (Mauldon, 1990)
- the Great Depression and periodic droughts
- the Rural Reconstruction Commission and the War Service Land Settlement Scheme (post World War II)
- the post-WW2 boom in large sectors of primary industries
- the perceived importance of expanded primary production and food processing to the balance of payments in times of fixed exchange rates
- the cost-price squeeze and the gradual substitution of capital for labour on farms, especially since World War II.

A notable feature of this period was the willingness of governments to intervene quite radically in land ownership, for example by the purchase or resumption of

large estates in order to redistribute it for closer settlement, in the pursuit of the social and economic objectives of that time.

The possible role of government in intervening directly in the *social* condition of farm families, and in the economic and social condition of rural towns, was not the subject of much attention. The social and economic problems of the cities during the years of the Great Depression must have seemed acute by comparison; indeed, there was significant migration of unemployed people to the countryside during this period. It might be argued that material poverty was in those years less damaging to well-being in rural areas.

5.3 1970-2000: Adjustment in a Mature Farm Economy

5.3.1 *From the 'farm' problem to industry adjustment*

A large number of factors and events influenced the economic condition of the industries represented in the farm sector in the Basin during this period, and hence the choice of enterprise, input mix and technology in those industries. Among these have been the following:

- Policies relating to the pricing of agricultural commodities (Mauldon, 1990)
- Input subsidies (especially finance and fertilisers)
- The gradual disillusionment with previous 'development' policies (Gruen, 1990).
- The entry of Britain to EC; and the increasing influence of US and EC on world markets for agricultural commodities;
- The gradual reduction of favourable tax treatment for primary producers
- Reform of the statutory marketing arrangements for farm products, and the gradual removal of underwriting by governments (Piggott, 1990), in

particular, changes in the marketing of wheat and wool.

- Deregulation of input, financial and product markets for both agricultural and non-agricultural products
- Continuation of publicly funded R&D for agriculture, and extension; recent changes in the funding and targeting of extension by State departments
- The continuing substitution of capital for labour on farms, including the use of technologies which allowed significant changes in land use.
- The ‘farm problem’ and adjustment policy (Harris et al. 1974; Burdon, 1993; McColl et al., 1997)
- Drought policy (Burdon, 1995; Drought Policy Review Task Force, 1990)
- Industry-specific policies, e.g., dried vine fruits, rice
- ‘Integrated’ programs for arid zones (Western Division, mulga lands)
- Policies relating to quarantine, animal health, genetically modified organisms, telecommunications and other services.
- From farm policy to rural (and ‘regional’) policy; DPIE, AFFA and DoTRS
- Increasing focus on the integrated pursuit of economic, social and environmental objectives in policy (the ‘three-legged stool’).

Cockfield (1993) provided a perceptive summary of these trends.

Until roughly the 1970s, what passed for farm policy was focused on supporting the production of individual commodities, reflected in a variety of pricing and marketing arrangements for different products.

By the 1960s, however, the place of a relatively mature (as distinct from pioneering) agriculture in western industrialised countries was being better understood in terms of the framework developed by agricultural economists such as T.W. Schultz and Willard Cochrane, as well as by the profession in Australia. The result was that instead of seeing the

chronic financial pressures on farmers in terms of inadequate returns for individual commodities, it was being characterised as a ‘farm problem’ (sometimes a *small* farm problem). This problem was seen as a consequence of the nature of the farm business itself and of the economic environment in which it operated. The solution was regarded as hingeing on the efficient use of capital (especially human capital) and the flow of resources (including people) into and out of the farm sector.

In particular, the tendency of the farm sector to experience chronic (and occasionally acute) financial stress and its attendant social damage started to be addressed in a framework of the economic characteristics of farm businesses in general, overlaid by the particular circumstances of Australian agriculture, including its exposure to high climatic risks and highly volatile world markets for its products.

A clear expression of this change in view was the Green Paper *Rural Policy in Australia* (Harris et al., 1974). In the same vein, assistance to farmers experiencing acute financial difficulties went from being made available under *Rural Reconstruction Acts* - with their positive connotations of ‘nation building’ - to coming under *Rural Adjustment Acts* - which implied the need for resources (and possibly people) to move out of the sector and not only into it.

The approach saw the farm sector as just another industry, with risk management being the responsibility of farm ‘managers’. It also emphasised the importance of making a clear distinction between policy measures aimed at improving the efficiency of the industry in aggregate (*i.e.*, without regard to the organisational form of farm businesses) and measures aimed at achieving equity or welfare objectives. By now, however, the place of farming in the national repertoire of cultural icons was firmly established, especially the lack of distinction between the business of farming and the attachment

of families to land. Consequently, the two arms of the policy were not clearly distinguished, and indeed operated to entrench an inefficient industry structure. The history of attempts to fully implement this approach in regard to drought policy has been similarly marked by confused signals (see Burdon, 1995).

Thus, there was a recognition of the intrinsic characteristics of a 'mature' farm sector in an industrialising (and subsequently post-industrial) economy, which included the recognition that there would always be 'marginal' businesses for which exit from the industry was imminent, while for others there would be constant adjustment pressure towards the substitution of capital (including human capital) for labour, and the expansion of farm size in order to use capital more efficiently. In a country where there was little 'new' land to develop, but where agrarian values generate the perception that farming is an inherited occupation and that the children of farmers can also expect to enter the industry, this set up inexorable tensions and a chronic 'adjustment' problem. There were, however, some examples of further 'new land' development.

Largely, the emphasis of farm policy shifted from settling more farmers on relatively small areas (the 'home maintenance area' lived on after World War II, even if not in name), to farm consolidation (the term 'build-up' retained the positive connotations of 'reconstruction') with the assistance of subsidised loans. This was never a widely used part of the RAS. Nor were the elements of the program that offered welfare assistance ('household support') as a loan which was not repayable if the recipient left the industry, and exit compensation ('re-establishment' grants) to those who did leave the industry. The fact was that farmers who had been refused further support by the banks (and were *prima facie* candidates for exit) continued to see the RAS as a source of

'carry-on' finance at concessional rates of interest. Until the deregulation of the finance industry, policy makers could rely on the argument that the rural credit market was imperfect (because of credit rationing), but the flagship components of the RAS continued to offer subsidised finance long after deregulation.

For a while the RAS was seen as a convenient way of easing the pain of (and political pressure from) the farm sector without resorting to more expensive and ultimately more distorting measures (in terms of economic efficiency) such as price support and input subsidies. As the various parts of the farm sector continued to experience severe adjustment pressure as a result of its exposure to its endemic risk factors, it was gradually realised that the RAS (and drought assistance measures, which suffered from the same internally inconsistent logic) were not only far from low cost measures, but worse, seemed to be institutionalising inefficient industry structures and behaviours. Seiper's (1982) study of rural policy was influential in drawing attention to what he termed 'the versatile application' of efficiency arguments to justify these measures.

Accordingly, the 1990s saw a concerted push towards the implementation of policies that made the treatment of farming and farmers consistent with that of other industries and occupations, and to pass the responsibility for managing the inherent risks of the industry on to farmers themselves, by withdrawing or diluting measures that underwrote those risks. The current policies still have some elements that allow different treatment for farmers and their businesses, especially 'exceptional circumstances' provisions.¹² At the same time, policies that attempt to enhance the human capital of individual operators, and the innovative and marketing performance of particular industries or segments of them, have been expanded.

5.3.2 *From farm policy to rural policy.*

From the early 1970s, the farm sector started to lose its power as the sole driver and determinant of the economic and social condition of rural regions. Recognition of this was already evident in the 1974 Green Paper, and was further developed in the Ministerial statements of Kerin (1986), Hawke (1989) and Anderson in the late 1990s.

Accordingly, the relevant policy instruments were no longer intervention in the markets for specific farm inputs and outputs, but instruments which encouraged the efficient adjustment of the farm business, including investment in human capital; improved capacities of farm managers to manage for risk; enhanced mobility of human resources, especially out of the farm sector; amelioration of the social costs of adjustment borne by those who leave the industry; enhanced innovation performance by individuals and public agencies serving agriculture.

To these have been added greater attention to policies aimed at stemming or reversing the decline in the economic and social condition of some regional economies. This decline is being driven by macro-economic and international forces external

to the Australian farm sector. While the prevailing economic rationalist policies of the late 1980s and most of the 1990s preferred to see the solutions to this problem in terms of ‘getting the fundamentals right’ (that is, the operation of national markets through national competition policy and generic welfare measures), there were also continuing attempts to find a coherent alternative policy rationale for deliberate and effective promotion of regional growth and well-being. At the moment, policy and programs rest heavily on the assumed capacities and resources of rural communities to develop and implement their own programs of regeneration, seeded by relatively small amounts of project funding. These are unlikely to be sufficient to alter the currently declining trajectories of many rural communities and regions — assuming it is a goal of policy to ensure these communities continue to exist. At the same time, as experience with the Farmhand Appeal showed, urban Australians have considerable empathy with the conditions of rural Australians, and willingly countenance expenditure to maintain the ‘existence values’ of rural Australia. To date, policies have paid little attention to delineating these values.

6 Water Resources Policy

6.1 Phase 1 — the First Steps

6.1.1 Victorian initiatives

Water was a major cause of unhappiness, disputation and administrative action from the beginning of settlement in south-eastern Australia (Lloyd 1988, Powell 1989, Powell 1991). Almost a century passed, however, before decisive and fundamental action was taken to address the causes of these problems, first in Victoria and subsequently other Basin States. Smith (1998) ascribed the Victorian initiatives to an accumulation of pressures (as described in section 4.3.2), together with the ‘climatic determinism’ of the 1877-81 drought. It was taken despite an inquiry in 1882, which concluded that irrigation would not be profitable on the Murray (Gordon and Black 1882).

Water became a significant political issue and the result was the passage of a number of pieces of legislation, starting with the *Water and Conservation Act* of 1880 and including the important *Irrigation Act* of 1886. The latter Act is generally accepted as the seminal piece of irrigation legislation in Australia. It:

- exclusively vested in the State the right to the use of, flow and the control of water in any watercourse;
- subordinated the rights of the individual in that private riparian¹³ rights could not compromise the cardinal rights of the state; and
- highlighted the need for the rights of the State and the individual to be fully defined (Mulligan and Pigram 1989).

The architect of the 1886 *Irrigation Act*, Alfred Deakin, argued that, without irrigation, the population of the northern plains would ‘be swept away, and the land must go back simply to sheep-farming’ (quoted by Tyrrell 1999: 127). Deakin held that the results of Californian

experience with irrigation could be repeated in Victoria. Irrigation, he claimed, would increase the value of farmland and make it desirable for families to subdivide their farms and plant orchards and vineyards that would provide a good living on intensively worked properties of as little as 40 or even 10 acres. Deakin’s proposal that the colonial government play an active role in the building of dams and distribution channels was justified by the desirability of making water available to farmers over the entire northern plains, not just those close to rivers and creeks.

A further arm of irrigation policy was the encouragement given by the Victorian government to the Chaffey Brothers to establish an irrigation colony on the Murray River at Mildura in 1887. The Canadian-born Chaffeys had established profitable irrigation colonies in California and were keen to repeat that success on a larger scale. The Victorian government offer of a land grant was matched by a similar one in South Australia, and in 1887 the Chaffeys laid out another colony at Renmark, also along the Murray. The Chaffey’s track record in California was impressive, but in 1894 they filed for bankruptcy.

The reasons for the early problems of these settlements also lay behind the difficulties experienced in later times by irrigators across the MDB. These reasons included:

- farmers’ attitudes to irrigation,
- purchase of irrigation blocks by speculators,
- the pricing structures,
- engineering inadequacies, and
- inattention to marketing¹⁴.

By the start of the 20th century there was a general consensus amongst observers of Victoria's irrigation systems that the policy of making local trusts responsible for decisions about the availability and price of water had been a failure. The trusts ran into difficulty — their infrastructure was not maintained and they failed to repay loans to the State or to pay for bulk water deliveries from State owned reservoirs. William H. Hall, an expert employed by the government of the Cape Colony (part of modern South Africa) to report on irrigation around the world, found that, in Australia, the policies of the Deakin era were flawed by 'inadequate government supervision', which meant that the public sector committed funds to irrigation development 'without assuming financial and technical supervisions to ensure that the expenditures were justified' (Tyrrell 1999: 150-1).

These events failed, however, to lessen the prevailing enthusiasm, which saw irrigation as providing a way of reducing climatic risk, and of providing a basis for colonial wealth and settlement of the hinterland, through agricultural development and closer settlement. The desirability of irrigation and its potential for success was almost considered to be self-evident. To deal with the criticisms, the Victorian government passed the *Water Act* of 1905. This abolished the irrigation trusts and paid out their debts out of consolidated revenue. A new statutory corporation, the State Rivers and Water Supply Commission (SRWSC) was set up to manage the State's water resources. In 1907, an American, Elwood Mead, who was 'probably the country's leading authority on irrigation' (Reisner 1993: 109), was appointed head of the commission. Mead argued that while Deakin had seen the main task for the public sector as that of making water available, insufficient attention had been given to educating farmers and converting them to small-scale intensive cultivation.

Under Mead's leadership, the SRWSC came to be perceived as having a remit for

the construction of storages, infrastructure, and ultimately, irrigation schemes themselves. Despite the failure of the Trusts, the desirability of such activity was not questioned and the task was seen as being essentially technical and calling for the skills of engineers. Not surprisingly, the relevant public authorities were therefore dominated by an engineering and developmental culture.

6.1.2 *Emulation by other States*

The other States of the Basin followed the lead set by Victoria. That is, they all vested control of water in the state and created bureaucracies to manage rural water development¹⁵.

New South Wales

The experiences with water in New South Wales during the 19th century were similar to those of Victoria (Lloyd 1988)¹⁶. Social attitudes toward irrigation development in the last two decades of the 19th century were similar to those in Victoria, and the droughts toward the end of the century stimulated a similar urge for legislative action. The pace of change was, however, somewhat slower. In 1896, the *Water Rights Act* was passed with the intention of legitimising private irrigation initiatives along the Murray and Murrumbidgee. It gave control of water to the State and provided for the licensing of the extraction of water for irrigation.

The construction of the Burrinjuck dam on the Murrumbidgee, and distribution canals for irrigation started in 1906. The *Murrumbidgee Resumption Act* and the *Murrumbidgee Irrigation Act* of 1910 authorised the purchase of 1.6 million acres of land on the north side of the river, below Narrandera¹⁷. Elwood Mead was employed by the New South Wales Government to help plan the scheme. The land was subdivided into irrigable holdings of between two and fifty acres, and roads, distribution channels, and drains were surveyed and constructed.

The *Water Act 1912*, provided a comprehensive base for the irrigation development of the rest of the 20th century. This Act cemented the demise of the common law principles of water use and ‘... inaugurated a system of private water exploitation under public licence whose essentials still apply today’ (Lloyd 1988, p.124).

South Australia

South Australia provides a somewhat similar history. (Hammerton 1986, Williams 1974). It shared with Victoria an experience with Trusts and other ventures, also with some unhappiness. Initially, the State was reluctant to encourage irrigation along the Murray because of the threat it might pose to navigability, the lack of guaranteed flows from the up-stream States and some fiscal stringency. These difficulties were lessened by the decline in the significance of navigation towards the end of the century.

Queensland

Interest in larger scale irrigation schemes gained momentum in Queensland in the 1880s. Following the failed passage of a Water Bill in 1886, Dr Elswood Chaffey, brother of William Benjamin and George of southern Australian fame, approached the Queensland Government about establishing irrigation colonies in that State (Powell, 1991). Subsequently, the Queensland Minister for Lands visited the Chaffey irrigation schemes on the Murray, and the Government’s own engineers undertook a comprehensive study of the irrigation potential of the State’s Rivers. The Irrigation Act of 1891 was, in Powell’s words “an embarrassing jumble ... littered with amendments reflecting parochial point scoring and outright confusion”. It failed to deal with the unsuitability of the riparian doctrine under Australian conditions and appears to have had little subsequent impact on policy. A companion Act of the same year, the

Water Authorities Act, was more influential. It empowered local authorities to provide water supply works and remained in force until 1942 (Powell, 1991).

6.1.3 The River Murray Commission

Institutional arrangements for the management of the Murray were among the contentious issues during the negotiations over federation. The reason for this was that the river was an important watercourse impinging on three of the Basin jurisdictions. Initially, debate was about navigation but, before it was resolved, management for extractive purposes became more important.

By the time of the federation conventions, there was conflict between the upstream States of New South Wales and Victoria wishing to use Murray water for irrigation purposes, and South Australia wishing to preserve in-stream flows for navigation. The resulting compromise was provision in the constitution for the Commonwealth to control navigation and shipping, and the inclusion of a guarantee to the reasonable use of water by the states for conservation and water supply.

It took a further 14 years before the River Murray Waters Agreement was concluded between the three States and the Commonwealth (Doyle and Kellow 1995). By this time, as mentioned above, South Australia was more concerned with guarantees of supplies for extractive uses than in flows for navigation.

The Agreement was enacted in 1915. It provided for equal sharing between New South Wales and Victoria of the flow at Albury, with each State retaining control of its tributaries below that point. It also guaranteed a minimum entitlement for South Australia. The River Murray Commission was established in 1917 to supervise the construction and operation of the regulatory facilities specified in the Agreement.

6.1.4 Overview of Phase 1

The important features of the reforms of the late 19th and early 20th century were the substitution of control by the State for riparianism, the institution of the right to use water under licence, the authorization of loans by the State to failed irrigation entities and the establishment of bureaucracies through which the States could exert their control over the resource. Thus rights to water were ‘nationalized’ and riparianism swept aside. Unfortunately, as will be seen below, while this represented an important step in the attack on the difficulties created by riparianism, and a repudiation of alternatives, such as the prior appropriation doctrine of the west of the United States¹⁸, it was only a start on what was needed if water was to be managed in a sustainable way. However, it did lay a foundation for the enhancement of agricultural output, and the accelerated settlement of the hinterland through the expansion of state-controlled irrigation.

6.2 Phase 2 — the March of Irrigation

6.2.1 Irrigation Expansion

Having vested control of water in themselves, created the necessary bureaucratic agencies, and having the necessary political will to proceed, the Basin States were ready to construct the storages and infrastructure to enable the establishment of substantial areas of government-sponsored irrigation farming.

There followed for most of the 20th century a period of unquestioned irrigation development dominated by engineering objectives that were, as Ward (2000) notes, of large scale but narrow scope.¹⁹ As Table 6.1²⁰ shows, this activity continued at a generally increasing rate, for most of the 20th century, with a more substantial level of development in the second period shown in the table.

Having rejected the possibility of allowing the establishment of private monopolies in the supply of bulk water, the States established public monopolies instead. The remit of these bodies was the promotion and development of irrigation. Smith (1998) refers to the steadfast and resolute pursuit of this mission by these agencies, and to the considerable power and influence they wielded. They were aided in these respects by the considerable political and community support for irrigation and closer settlement²¹, and an almost boundless optimism in the future of Australia’s agricultural industries²².

Throughout Australia, confidence in dairying and wheat growing was also buoyant, and was supported by railway building that opened up new areas for settlement. Stuart Murray, the first head of the SRWSC, predicted in 1908 that with irrigation and closer settlement Australia would eventually support a population of 180 million (*Argus* (Melbourne), 18 April 1908). World War I did not diminish the belief that Australia’s future would revolve around primary production. Irrigation development. Closer settlement continued, and new areas of land were

Table 6.1. Capacities of major dams (over 100GL capacity) in Australian States – 1900, 1940, 1990 (’000 Gigalitres)

Year	Victoria	New South Wales	South Australia	Queensland	Totals
1900	0.13	0.08	0.02	0.01	0.25
1940	4.50	3.63	0.12	0.07	8.73
1990	12.22	25.41	0.26	9.80	87.26

Source: Smith 1998.

opened up for wheat growing, the latter being inspired by the belief that with 'modern' methods of cultivation, settlement could take place in areas hitherto considered too dry for successful farming. Land was made available for returned soldiers and for a scheme of Empire Settlement, under which the Commonwealth and British governments shared the costs of placing British migrants on the land. The new land that was made available was generally snapped up by people who wanted to farm.

Not surprisingly, close relationships between the irrigators and the relevant irrigation authority were established. The resulting partnerships came to function as potent political forces, which exerted considerable influence over the direction of irrigation policy. When widespread financial problems emerged in irrigation districts, concessions were readily made to irrigators. Hindsight shows that this influence was to produce results not always in the interest of society at large.

Problems with these schemes soon began to appear. Small blocks encouraged settlers to irrigate every patch of ground, even those that were subject to salinity. Many of the settlers on closer settlement blocks lacked capital and knew little or nothing of irrigation (*Royal Commission on Closer Settlement* 1916). Soldier settlement failed disastrously for similar reasons. British settlers took up land that they were told would grow wheat, but turned out to be vulnerable to drought and wind erosion. 'By the end of the 'twenties Commonwealth and state governments had found that the mixture of closer settlement and diversification was costly and largely unproductive' (Schedvin 1970: 64).²³

In the case of the Murrumbidgee Irrigation Area, the New South Wales Government hoped to avoid the early problems experienced in Victoria and South Australia by selling the land resumed for irrigation to the settlers, at prices enhanced by the prospect of irrigation. The proceeds from these sales were intended to

pay the costs of the Government investment in the scheme. In the event, collection of payment for either land or water rates was not possible and, in 1914 and 1916, legislation was passed suspending payments. This experience was repeated in 1919 when soldier settlement occurred in the Areas.

The persistence with irrigation development, in the face of accumulating evidence of its fundamental economic non-viability was remarkable. At some time the tide could be expected to turn. And turn it did; but not for several decades after World War II. In the meantime there were two developments which played an important role in maintaining the political commitment to irrigation development in the face the accumulating evidence of its marginal economic viability. Firstly, rice became an important and profitable crop in the south western irrigation districts of New South Wales²⁴. The second development was the construction of the Snowy Mountains Scheme²⁵.

Apart from its considerable engineering virtues, the process whereby the Scheme came into being was, as with the River Murray Waters Agreement, an example of the potential for the Commonwealth to provide leadership in the resolution of conflict between the States over boundary and trans-boundary rivers. Not only did it use its powers of persuasion, it also employed its coercive ability, by employment of its defence powers under the constitution, to declare that the electricity to be produced by the scheme was essential to the Nation in time of war (Lloyd 1988). It also used its financial 'muscle' by financing the construction of the Scheme. The States were to repay the loan from the proceeds of the sale of electricity produced by the Scheme; an arrangement amounting to the provision of a subsidy for the irrigation water from the Scheme.

The Scheme was not without controversy during its development²⁶ and immediately after its completion. Davidson (1974) commented on the unsatisfactory results of

the Scheme. He also reported an estimate by McColl that the same quantity of electricity could have been produced more cheaply from alternative sources. In addition, he refers to his own calculations that showed a meagre return from Snowy irrigation water after allowing for all costs²⁷.

6.2.2 *The Ebb of the Irrigation Tide*

Investment in storages and irrigation infrastructure continued at even higher levels after World War II. Important changes in community attitudes were, however, appearing. These, first, changed the nature of government involvement and then, second, led to questioning of the desirability of continued irrigation development. The latter resulted in the virtual cessation of the construction of publicly funded storages in the Basin. It did not, however, prevent the continued expansion of irrigated acreage and privately funded storages.

The 1960s saw a decline in support for closer settlement, as realisation spread that Australia's comparative advantage lay in broad acre farming, not the establishment of a small farm yeomanry as envisaged in the late 19th and early 20th centuries. This realisation applied to irrigation as well as to dryland production. Further, there was a growing appreciation that closer settlement was also an inefficient tool for the redistribution of wealth and the pursuit of social justice.

This change in attitude reinforced concerns about the fiscal burden of continued public sector development of irrigation schemes. As a result, government involvement in such schemes ceased, though government involvement in the construction of storages did not. In addition there was a burst of smaller-scale, private dam construction in northern New South Wales in the mid-1960s to late 1970s to support expansion of the cotton industry. This expansion of storage ran in the face of the emerging sentiment against

the provision of irrigation works, within the Basin and in Australia generally.

Within the space of a few years, cotton had become a major irrigated crop in the Basin. While many cotton farms were family businesses, a number were owned by corporate entities. So the tradition of smallholder, irrigated agriculture gave way to large scale farming, in which incorporated entities played a major part, at least in New South Wales and Queensland.

From the outset, development of irrigation in Australia had its detractors. But it was not until the late 20th century that their arguments were able to blunt the enthusiasm of the wider community for the romance of 'making the desert bloom', and the belief that the development it represented was in the overall national interest. The State water agencies and their senior engineers had provided the expertise needed to attempt the realisation of the romantic visions. That irrigation was in the overall national interest was axiomatic; and the need for critical, including economic, analysis was not considered necessary. As economic critiques of irrigation over-development emerged in the 1960s, the arguments put forward initially made little impact on the pro-irrigation forces.

In September 1963, Professor Keith Campbell sounded a call for the questioning of the previously unquestionable, and pleaded for a greater input from economics in the assessment of irrigation projects. Further questioning of irrigation policy by academic economists followed, chiefly from Dr. Bruce Davidson. He mounted a trenchant attack on the development of irrigation in his book *Australia Wet or Dry? The Physical and Economic Limits to the Expansion of Irrigation*.

Davidson and others argued that the promotion of intensive irrigated horticulture was fundamentally ill-founded, given that Australian agriculture's competitive advantage lay

with extensive production of durable commodities. As a consequence, intensive irrigated production would remain uneconomic without substantial government subsidy²⁸.

With the passage of time, the logic of the economists' case became accepted and the wider community came to doubt the value of further dam building and subsidisation of irrigation water supply. This view was strengthened by the suggestion that Australia had become a mature water economy (Watson and Rose 1980, Randall 1981). This suggestion arose from the observation that the provision of new storages and infrastructure was becoming increasingly expensive, that the low cost sources of supply had, by now, been utilized, at the same time that the opportunity cost of development was becoming higher.

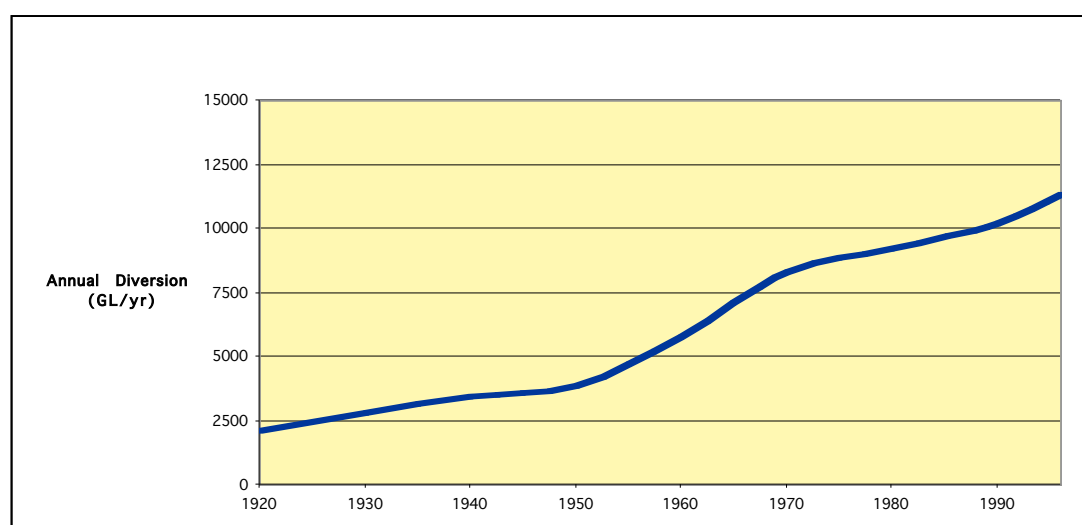
To these arguments were added a number of emerging concerns about the environmental consequences of past, let alone future, irrigation development. These concerns relate to the degradation and sustainability of existing levels of water use, along with questions of water quality. Watson (1990) argued that these two strands of concern over irrigation, economic and environmental, called for a shift away from a single dimensional

concern for water as a resource for development and extractive use, to an integrated view of the resource as part of an ecological, economic and social system. Such a view, if adopted, would require fundamental reform of the way water was managed. Clearly the institutions created in the 19th century for the purpose of development would no longer be appropriate. Fundamental reform would be necessary. Some steps in this direction had already been taken, but the 1990s saw the commencement of explicit and formal action to achieve the integrated approach Watson advocated.

6.2.3 Overview of Phase 2

The first six decades of the 20th century saw the spread of irrigation, mainly in the Basin, in a burst of 'nation building', which had the virtually unquestioning support of the whole community. The public irrigation schemes, which dominated this development, were major engineering and administrative achievements. They also represented considerable struggle and sacrifice on the part of the settlers of the predominantly small farms established as a result of the prevalent closer settlement philosophy. In the 1960s, enthusiasm for this type of irrigation development waned, due to

Figure 6.1 Diversions for consumptive uses in the Murray-Darling Basin



Source: State of the Environment Advisory Council (1996)

shifting political priorities and the abandonment of closer settlement, fiscal stringency, and mounting questioning of the economic desirability of such endeavours. Government involvement in the construction of storages continued and the additional water was used to intensify irrigation in existing irrigation areas and districts, or to enable the growth of private irrigation, mainly for cotton in northern New South Wales and southern Queensland. As figure 6.1 shows, the level of diversion of water for consumptive uses in the Basin continued to grow despite the passing of government involvement in irrigations schemes and storage construction. At the end of the century, the Basin had been bequeathed a substantial irrigation industry, a large inventory of storages and a widespread, but somewhat decayed, infrastructure. It also inherited an alarming level of land and water degradation, the nature of which was only dimly perceived, prior to 1990.

6.3 Phase 3 — the Late 20th Century Reforms

6.3.1 The 1980s

While there was concern about rising watertables, water logging and salinisation, which led, in part, to the Murray-Darling Basin Agreement, reform, in the 30 years from 1960 to 1990, was driven by economic and fiscal, rather than environmental or other considerations. Over the period, there was an increasing reluctance on the part of the States to commit themselves to further expenditure on major works, while on the other hand, irrigators were anxious to have more water committed to irrigation or to make existing capacity go further. The construction and development role of the rural water agencies received less emphasis, while that as water planners, managers and ‘conservers’ was increased (Lloyd 1988, Powell 1989). Increasingly water became regarded as an economic commodity and pressure was placed on water agencies to treat it as such. This was exemplified, in Victoria, by the separation of water

planning from operations in two separate agencies in 1984, and, in New South Wales by the passage of the *Water Administration Act 1986* one of the purposes of which was to ‘ensure the provision of water . . . in a commercial manner’. In anticipation of the need for such action, the New South Wales Government, in 1977 issued a moratorium on the issue of new water licences on the grounds that all dams were fully committed.

Two important developments were the introduction of benefit cost evaluations of new storage proposals from the mid-1960s, and the approval, in the early 1970s, of transferability of water entitlements.

Benefit-cost analysis

The requirement of the Commonwealth, that the States should accompany proposals for financial support for the construction of storages with an acceptable benefit-cost analysis, was a significant departure from past practice. This initiative attracted wider attention to the economic arguments for and against irrigation development and raised the status, in the wider community, of economic evaluation. It also represented a more active role on the part of the Commonwealth in the assessment of the worth of irrigation proposals. Despite its significance, political and other considerations meant that the new requirement did not immediately stem the tide of construction. In the longer run, however, it contributed to the emerging opinion that further irrigation development was questionable on economic grounds and, so to the effective cessation of publicly funded dam construction from the late 1980s on.

Transferable entitlements

In 1967, in response to drought, temporary transfers of water between family members, within and between Districts in

the Murray Valley were permitted. At the same time volumetric allocation of water began to emerge, also in the Murray Valley. The subsequent elaboration of these developments meant that the later introduction of tradable water entitlements would be possible.

Transferability of entitlements, at least on a temporary basis, became established practice, at least in New South Wales and South Australia, from the early 1970s on. It was encouraged, both by the exhortation of economists and by the attraction to irrigators of the resultant greater flexibility of water use it made possible, particularly in dry times. Queensland and Victoria were slower to adopt the practice, while permanent transfers were embraced only in the 1990s.

Economists argued, then as now, that trade in entitlements would result in water being transferred to its highest value use. In reality, the extent to which this has been possible has been restricted by concern over possible economic and environmental third party effects²⁹ and, in the case of permanent transfers, the high transaction costs involved.

Price reform

The 1980s also saw the initiation of price reform. Most States indicated that they intended to recover more of the costs of supply from users. Some of them set the goal of recovering all operating and maintenance costs. In the event, variable progress was made with mostly minor and gradual price increases. Most progress was made by Victoria, which reported that the deficit from the operation of irrigation systems dropped by 80 percent from 1984 to 1994 (Langford et al 1999)³⁰. Apart from Victoria, significant progress with price reform was not to occur until the 1990s.

6.3.2 The Murray-Darling Basin Ministerial Council

Despite the unavoidable tensions between the States over the allocation of the Murray waters, the River Murray Waters Agreement endured for over 70 years. While receiving its share of criticism (Doyle and Kellow 1995, Paterson, 1987), it must be regarded as having been a successful instrument of co-operative federalism, and of inter-governmental river basin management. Paterson (1987) in offering some reasons for this, points to the successful culture of cooperation between the States' personnel, which developed. He attributed this, at least in part, to the relevant agencies being left to their own devices to pursue their responsibilities under the Agreement, and the way in which the invasion of their territory was consequently minimized.

Eventually, however, as concern over the salinisation of the Murray increased, the restriction of the River Murray Commission to the management of water quantity came to be seen as a problem. Following over a decade of inter-governmental wrangling, the Murray-Darling Basin Ministerial Council was established in 1985 and the Murray-Darling Basin Commission (MDBC) replaced the River Murray Commission. The Murray-Darling Basin Agreement replaced the River Murray Waters Agreement.

The new Commission inherited the statutory duties of the River Murray Commission and was also directed to provide advice to the Ministerial Council on land use and environmental issues – matters not included in the old Agreement. Doyle and Kellow (1995), in discussing the establishment of the Council and Commission, point to the importance of political will in overcoming the inertia of bureaucracies when the latter are confronted by possible destabilization of their powers and threats to their jurisdictional boundaries. They claim that, in the absence of such commitment, the

new Agreement, and its associated institutions, may not have been possible.

Committed political leadership was also important in the establishment of the Salinity and Drainage Strategy. This is an inspired policy, which, as Doyle and Kellow (1995) put it, converted the Basin's salinity problem from a zero sum game into a positive sum game, in which all States stood to gain.

6.3.3 *The 1990s*

Reform continued into the 1990s with important developments in price reform, the water bureaucracy and, at least in New South Wales, the ownership structure of irrigation areas themselves. A particularly important development was the formulation of the Council of Australian Governments (COAG) framework for water reform, and the embedding of the framework in the National Competition Policy.

Organisational reform

The commercialisation of the provision of water services was maintained and entrenched in the three main Basin States during the 1990s.

South Australia: South Australia replaced its specialist water department, Engineering and Water Supply, with the South Australia Water Corporation (SA Water), a state-owned corporation, in 1995. This initiative had a number of original features for the Australian water industry. These included the adoption of franchising for the operation of water supply services to metropolitan Adelaide.

Victoria: In 1993, the policy and regulatory responsibilities of the Victorian Rural Water Corporation were transferred to the Department of Conservation and Natural Resources. Provision of rural supply was transferred to five new rural

water authorities (RWAs). This reform required major modification of the water allocation system, which had evolved under the old centralized order. The RWAs were given bulk entitlements to water, which they then retailed to their various farm and urban customers. In this way, the Victorians, like the South Australians, achieved separation of the operators from the regulator, and a high level of commercialisation of the former. The RWAs are required to charge full cost recovery prices, including a renewals annuity to finance future capital expenditure, and to pay a dividend, reflecting a return on new investment, to government.

New South Wales: In 1995, the New South Wales Department of Water Resources was merged with a number of other resource management agencies (particularly the Soil Conservation Service) to form the Department of Land and Water Conservation. This initiative meant the demise of a specialist water agency, which, despite moves towards commercialisation, retained a substantial element of the old engineering development culture. Operations, policy and regulation were, however, still within the one body. A move towards rectification of this situation was made in 1998 when a specialist water service provider, State Water, was established. The move did not, however, constitute a genuine separation of responsibilities as State Water, though 'ring-fenced', remained part of the Department.

More adventurously, in the 1990s, New South Wales moved to privatise its public irrigation schemes. By 1999 all irrigation areas and districts were private corporations, with the exception of the Coleambally Irrigation Area, which became a cooperative. In all cases, the irrigators within the areas and districts became the shareholders of the incorporated entity. The privatised body holds a bulk water licence and distributes water to irrigators on a contractual basis.

Price reform and regulation

As indicated above, the move towards cost recovery continued in the 1990s. A significant new development was the establishment of a price regulator in most jurisdictions. Most significant of these has been the Independent Pricing and Regulatory Tribunal (IPART) in New South Wales. It determines the maximum prices that government monopolies, referred to it, can charge. In December 1995, determination of bulk water prices was referred to the Tribunal.

As at the beginning of 1999, the other Basin jurisdictions, with the exception of the Australian Capital Territory, have experienced difficulty in emulating New South Wales in determining water prices through an open and independent inquiry process. South Australia appointed a competition commission to investigate water prices in 1997, though ultimately the Government did not accept the commissioner's recommendation. In Victoria, a plan to have the Office of the Regulator General determine water prices was put on hold in late 1995 because of a number of government concerns. Queensland has not referred bulk water prices to the Queensland Competition Authority. The Australian Capital Territory Independent and Regulatory Commission sets prices for the Australian Capital Territory Electricity and Water Authority.

Enter the environment

The above reforms reflected shifting community priorities and perceptions, government fiscal pressures and a deregulationist, market oriented thrust in public policy. To these drivers of policy were now added concern over the impact of extractive water use on the health of the rivers and the landscape generally, and over the continuing growth in water use, particularly for irrigation. These concerns were driven by improved understanding of the status of the environment and the causes of its degradation, a wish to

improve that status and to attack the causes of degradation. This was reflected, nationally, and in a broad sense, by the adoption of the National Strategy for Ecologically Sustainable Development in 1992. As already noted, the COAG water reform framework is notable for its consistency with the principles of sustainable development.

In late 1995 the Murray Darling Basin Ministerial Council imposed a 'cap', or moratorium, on extractive use of water in the Basin. This reflected a feeling that such use was close to or above its sustainable maximum. Extractions under the cap, in any year, are limited to those compatible with what would have occurred given the level of development in 1993-94.

The entry of environmental considerations into water resource management marks a convergence between environmental policy and natural resource management policy. The former has largely been concerned with the restoration of environmental quality, while the latter has been concerned with allocation among competing uses. The tensions inherent in this convergence are still being worked through, and are evident in the contested representations of the inland rivers — 'working rivers' in which ecological function is maintained sufficient only to protect water quality for consumptive uses, or 'riverine reserves' in which biodiversity and ecological function have primacy.

COAG and the National Competition Policy

Despite the progress to the early 1990s, the potential benefits of further reform were recognized first by the Industries Commission (1992) and then by COAG in 1993. The COAG framework followed in 1995 and was subsequently incorporated in National Competition Policy. If nothing else, the framework codified the water reform process and provided incentives for the pursuit of reform on a

coordinated and national basis. This, of course is important for the Basin because of its inter-jurisdictional nature.

The framework was, and remains, notable for its comprehensiveness, for its inclusion of environmental considerations, and for its recognition of the need for generating community awareness and education. It first called for pricing reform based on the principles of full cost recovery, and the removal of cross-subsidies. Remaining subsidies were to be made transparent. Second, jurisdictions were to adopt comprehensive systems of water allocation or entitlements, including allocations for the environment as a legitimate user. Water property rights were to be separated from land titles, so entitlements could be transferred between land title-holders. Third, structural separation of water service provision from water resource management, standard setting and regulatory enforcement, was to be achieved by 1998. Fourth, two part tariffs³¹ were to be adopted for urban water systems when such an approach was cost-effective. Fifth, arrangements were to be introduced for trading in water systems or entitlements. Sixth, by 2001, rural water charges were to recover all costs with transparent subsidies. Seventh, future investment in new irrigation projects or extension to existing works was to be undertaken only after they were demonstrated to be economically viable and ecologically sustainable.

In a further achievement of co-operative federalism, the States and the Commonwealth have developed a non-coercive process, incorporating a set of principles, targets and incentives. The States could determine their own best course of action within a highly consultative national framework. Further, the embedding of the COAG framework in the National Competition Policy meant that the States had agreed to an arrangement whereby the Commonwealth could spur reform despite the diversity and complexity of the federation.

The Commonwealth provides financial assistance to the States that implement the agreed reforms upon. It determines which states are eligible on the advice of the National Competition Council. There are three tranches of payments with the last due in July 2001. There was agreement that, because of the magnitude of the task, progress with water reform would not be a condition for payment of the first tranche. Consequently, the first review of progress by the National Competition Council was prior to payment of the second tranche in 1999. Rural water pricing was not to be reviewed till 2001.

In its June 1999 review the Council reported substantial progress on implementation of the framework. The Australian Capital Territory, the Murray Darling Basin Commission and Victoria were said to have largely met their obligations. New South Wales had made substantial progress but still needed to reform property rights and water trading. Queensland had a number of outstanding issues and the Council recommended suspending 25 percent of States payments pending resolution of concerns over a number of rural schemes. Improved understanding of the complexity of water trading, and of achieving ecological sustainability, led to implementation of reforms in those areas being extended for three years to 2001.

6.3.4 Overview of Phase 3

Irrigation development in the Basin continued at an increased rate after World War II. Forces to retard it were more than balanced by the continued advocacy of expansion. The former included the abandonment of closer settlement, fiscal pressures on the state governments and increasing questioning of the economic efficiency of irrigation. The continued advocacy of irrigation came from the irrigation lobby, including existing and potential irrigators (particularly cotton growers) and the water management bureaucracy. This advocacy resonated favourably with a community reluctant to

abandon its yearning to see the ‘desert bloom’.

Eventually, however, the retarding forces started to prevail. Initially, policies such as volumetric allocation and transferable water entitlements, which encouraged greater flexibility and more productive water-use were put in place. At the same time, the insistence of the Commonwealth on requests for financial assistance to be accompanied by benefit-cost studies helped the spread of informed questioning of the economic merits of irrigation development. These developments were accompanied by changes in the charter of the water agencies from development to the commercial delivery of water services.

In the 1980s, fiscal pressures saw governments trying to recover a greater proportion of the costs of water supply from users. Finally, in the 1980s, and

particularly in the 1990s, environmental issues, and concerns over the sustainable use of the waters of the Basin, joined criticism of the efficiency of irrigation, and of the equity of new, subsidized development.

By the mid-1990s there had been substantial irrigation reform, but it was uneven across the states and, generally, much remained to be done. Consequently, the development of the COAG framework and its incorporation in the National Competition Policy were important codifiers and facilitators of reform. Without these developments, one wonders if coherent progress towards sustainability across the Basin as a whole would have been possible. Even so, the results are still far from in and while indications are that this exercise in co-operative federalism has, so far, been successful, the final accounting has yet to occur.

7.1 The 19th Century Legacy

³²While a number of 19th century scientists had developed some appreciation for the special qualities of Australian flora and fauna, the dominant colonial view was that Antipodean nature was a topsy-turvy world of strange reversals of the natural ‘normality’ of Europe. Acclimatisation societies were formed by eminent citizens in the latter half of the 19th century with a view to replacing the freakish flora and fauna of Australia with the creatures of ‘home’ that would delight the ears and eyes of the traveller in wastes of the interior. Deer, hares, sparrows, starlings, redfin, carp, tench, roach, and trout were successfully introduced by these societies. Fortunately, plans to introduce monkeys, agoutis and boa constrictors did not come to fruition. By the time of Federation, the introductions and the practice of agriculture had made considerable impact on the rural environment — impacts that had not gone un-noticed by colonial scientists and professionals.

Soil fertility and wheat yields declined over the latter half of the 19th century, a Royal Commission into cereal diseases in South Australia in 1868 concluding that vast areas of wheat country were being robbed of their phosphorus and other nutrients due to the lack of manuring. A subsequent commission of inquiry in South Australia was told by witnesses that it was far cheaper for farmers to take up new land than to attempt to restore the fertility of lands exhausted by continuous wheat cropping.

In the forested eastern and southern parts of the Murray-Darling Basin, growing concern was expressed by foresters and other professionals that large scale clearing would lead to the diminution of rainfall. In New South Wales, the assertions of those opposing ring barking were dismissed by prominent landholders

in the legislature who could recount from their own experience how ring barking had increased the availability of water, with springs appearing where there had been none before. Ironically, these landholders were describing the early symptoms of water table rise and salinisation.

In the infant irrigation areas, it was known to scientists that much of inland Australia was underlain by saline groundwater, and it was known to government engineers that large quantities of water could be lost by seepage from channels. However, no 19th century professional seemed to connect the two. In the twenty years to 1900, the water table in the Kerang District rose from about 7.5 metres below the surface to within 2.5 metres of the surface.

By the turn of the century, and in the wake of the collapse of the pastoral industry, there was already widespread recognition of the special nature of the semi-arid rangelands (Holmes, 2000). A number of scientists and perceptive pastoralists (such as George Ranken, Fred Turner and E.G. Millen) had drawn attention to the role of drought, rabbits, overgrazing, exotic weeds and the withdrawal of Aboriginal burning in the deterioration of range condition. These processes were acknowledged again in the Royal Commission that led to the Western Lands Act (1901). Drought was accepted as the normal condition for the semi-arid rangelands and it was accepted that most of the region was unsuitable for closer settlement.

The colonial governments of the 19th century responded in various ways to these emerging problems. By 1900, all the States had established departments of agriculture, in some cases with associated agricultural colleges. The goals of the departments of agriculture were, however, as much about expanding agriculture as

about preventing the worst excesses of 19th century ignorance and agricultural mismanagement.

The march of settlement and clearing led to the speculation that one day there would be no natural areas left for recreation. New South Wales gazetted the Royal National Park Act in 1879. The slopes and plains of the Murray-Darling Basin, far removed from the growing metropolises of the State capitals, exhibited little similarity to 19th century romantic ideals of nature for recreational purposes and excited no conservation interest. However, the delineation of the Western Division in NSW in the Crown Lands Act of 1884, and the retention of leasehold as the dominant form of tenure, reflected the recognition by the New South Wales Government that the semi-arid rangelands would continue to require substantial state intervention in their settlement.

Apart from providing for possible government influence on land management through leasehold tenure, some governments passed legislation to impose obligations on landholders whose failure to control weeds or vertebrate pests was constituting a nuisance to other landholders (for example, the Thistle and Burr Act of 1862 and the Rabbit Destruction Act of 1875 in South Australia).

7.2 Expanding Agriculture and Erosion — 1900-1930

One consequence of the application of science to the problems of agriculture about the turn of the century was that the technological innovations of new wheat varieties, inorganic fertilisers and fallowing for weed control and moisture retention made possible a huge increase in the area of land under cultivation — from slightly over two million hectares in 1890 to just under nine million hectares in 1930. Fallowing was particularly damaging, with erosion gullies two metres deep and three metres wide forming on cultivation land in

some areas within a period of only ten years.

Not only did the technological innovations reverse the 19th century decline in wheat yields, but they also made possible the cultivation of lighter, infertile and erosion-prone soils. As the States continued to support closer settlement, agriculture spread into marginal areas such as the Mallee in Victoria and the Pilliga in New South Wales.

The farming of land on the margins of the semi-arid rangelands inevitably resulted in serious wind erosion problems. South Australia passed a Sand Drift Act in 1923, which provided for penalties not exceeding the value of the land of landholders who failed in their statutory obligation to control wind erosion and caused a nuisance to the public or other landholders. During the first few decades of the 20th century, South Australia also reformed legislation that placed obligations on landholders with respect to weeds and pests — the Vermin Act of 1914 and the Noxious Weeds Act of 1931.

In contrast, New South Wales during this period did not take any substantial legislative initiatives aimed specifically at wind and water erosion, although the Western Lands Act of 1901 attempted to ameliorate these problems through conditions on leasehold tenure. This was not successful, with a Royal Commission in the early 1930s covering much of the ground that had been covered in the Royal Commission that preceded the Western Lands Act.

In Victoria, a Sand Drift Committee was formed in 1933 to look into the problem of wind erosion in the Mallee. While legislation was enacted in 1938 that prohibited cultivation within a certain distance of water channels, other events brought all forms of soil erosion onto the political agenda, subsuming the Mallee wind erosion problem.

The lack of concerted action in the first three decades of the 20th century to do

anything about the ongoing land degradation set in train in the 19th century was partly due to the nationalist fervour following Federation and the onset of World War I, together with the popularity of the United States as a model for how Australia might develop. The Under Secretary for Colonies in 1923 observed that:

If the United States has grown in the last century from five million people to a hundred millions, there is no reason why, in the coming century, we should not grow to a population of two or three hundred millions of white people in the Empire...

(cited by Flannery, 1994)

One voice that attempted to correct the jingoistic visions of a mighty nation down under to rival the United States in size was that of Griffith Taylor, a professor of geography at Sydney University. At a time when White Australia policy was largely unquestioned, Taylor was vilified for his views that the population of Australia would be limited by environmental constraints and that Asian emigration might be beneficial in developing the north of Australia. Taylor was eventually forced to leave Sydney University in 1928 and further his career at the University of Chicago. Clearly, any attempts during this period to suggest that the expansion of agricultural settlement was destroying the nation's land resources would have received scant political attention.

7.3 The Soil Conservation Acts — 1938-1951

Ironically, though, it was events in the United States that provided part of the impetus which initiated a period of widespread concern about soil erosion in the late 1930s and the 1940s. A series of droughts from 1929 to 1932 resulted in dust storms that reached Melbourne and Sydney and brought the wind erosion problem to urban and political notice. The 1920s and 1930s were also the period of rapid expansion in cultural production in the USA with the advent of commercial

radio and cinema. Australian radio stations and cinema presented a substantial amount of material from the USA, such that the stories of the Kansas Dustbowl and the community mobilisation against soil erosion were well known in Australia. The 1930s and 1940s also saw the publication of a number of books about soil conservation aimed at a lay audience (see, for example, Jacks and Whyte, 1939) — *The Rape of the Earth.*)

In 1936, a conference of State and Commonwealth Ministers recommended that the States set up soil erosion committees to examine the problem. The New South Wales committee, which had already been set up in 1933, recommended that a senior member of the staff of the Agriculture Department, Sam Clayton, be sent to the USA to investigate action being taken there. Bradsen (1988, 2000) argues that Clayton's enthusiasm for the USA approach resulted in a significant change of direction in soil conservation policy in Australia. State legislation in the USA was based on education and extension measures, together with financial support, in contrast to Australian soil conservation legislation to that time which had been based on establishing a statutory obligation on landholders to take measures to prevent soil erosion.

The New South Wales Soil Conservation Act of 1938 established a Soil Conservation Service whose function was to carry out research into soil erosion problems and educate and advise landholders. The Act empowered the Minister to declare areas as soil erosion hazards and require landholders to undertake soil conservation works. The Act also established the Catchment Areas Protection Board to exercise greater control over Crown land lessees in areas important for water supply. Consistent with the USA model, the Act did not establish a statutory obligation on landholders to prevent soil erosion.

The South Australian Soil Erosion Committee was formed in 1937 and reported to the government in 1938. The

Soil Conservation Act of 1939 constituted an Advisory Committee on Soil Conservation to advise the Minister, who could make grants or loans for soil conservation purposes and direct that landholders undertake soil conservation works. In contrast to New South Wales, the Act did not constitute a new authority, but was to be administered by the Department of Agriculture.

Victoria formed a Soil Erosion Committee in 1937, which reported to the government in 1938. Premier Albert Dunstan had dismissed the findings of the earlier Sand Drift Committee and again took no action on the findings of the Soil Erosion Committee. In 1939, the Victorian branches of the Institution of Engineers, the Australian Institute of Agricultural Science and the Institute of Foresters formed a Joint Committee after a symposium on soil erosion. The Committee submitted a memorandum to the Victorian Government describing the action being taken in New South Wales and South Australia and arguing that similar action needed to be taken in Victoria. Again no action was forthcoming from the Dunstan Government. Finally, it was the actions of Harold Hanslow, a commissioner of the State Rivers and Water Supply Commission, that forced the Government into action. Hanslow, also a staunch supporter of the Country Party submitted a letter criticising the Government's position on soil erosion for publication in the official journal of the Party, arranging for its publication to be delayed while a copy was sent to Dunstan. Dunstan threatened to sack Hanslow, who delivered an ultimatum to Dunstan that unless soil conservation legislation was introduced, the letter would be published.

The Victoria Soil Conservation Act was passed in 1940. The Act constituted a Soil Conservation Board which would undertake research and education of landholders. Regional Advisory Committees were to advise the Board and undertake extension activities in their regions.

Queensland also formed a Soil Erosion Committee in the 1930s, but this appears to have been largely inactive. However, erosion problems did not completely escape attention during the 1940s. The Burdekin River Trust Act of 1940 was a response to the need to control river erosion on the Burdekin, and in 1941, Department of Agriculture and Stock sent one of its officers to New South Wales to examine the soil conservation methods being used by the Soil Conservation Service. The Department of Agriculture and Stock established a soil conservation branch of its own volition in 1947. This drew attention to the serious soil erosion on the Darling Downs, where some 16 000ha of cultivation had become unusable due to erosion. The Queensland Soil Conservation Act of 1951 created an Advisory Committee reporting to the Departmental Secretary. The Committee was to undertake education activities, coordinate the activities of other departments and report on action to prevent or ameliorate soil erosion. As in New South Wales, the Minister could declare areas to be soil erosion hazards and require landholders to undertake soil conservation works.

The outcome of the 1930s and 1940s period of concern about soil erosion was the establishment of a largely voluntarist approach to soil conservation, with coercion or punitive measures only being applied to landholders as a last resort. This departure from earlier approaches which involved statutory obligations for landholders may have been the consequence of the influence of events in the USA as Bradsen suggests, or of the recognition that soil conservation measures were more difficult and more costly than weed or pest control. Certainly, the approach of education and assistance was consistent with that which had been used with good effect by the departments of agriculture since their establishment. With the exception of New South Wales, the soil conservation acts set up mainly advisory structures with any coercive or punitive powers lying largely in the hands of Ministers. The experience

in Queensland shows that at least one of the departments of agriculture was capable of responding to the soil erosion problem without political and legislative direction. However, it is likely that in many cases there were conflicts of interest within agriculture departments that prevented them responding to soil erosion problems. In New South Wales, for example, the Department of Agriculture continued to promote the production benefits of bare fallowing, despite being aware that this was encouraging soil erosion.

7.4 Assessment and Extension — 1951-1975

7.4.1 Erosion Surveys

One of the first actions taken after the establishment of instrumentalities with a responsibility for soil conservation was to survey the extent of soil erosion. In Victoria, the legislation had provided for a survey to be carried out by the officers of the Lands Department, the State Rivers and Water Supply Commission and the Forests Commission during their travels round the State. This was not accepted by the departments involved and surveys in Victoria were confined to small areas examined by staff of the University of Melbourne and the Council for Scientific and Industrial Research (CSIR). The latter, reporting in 1948, found that almost half of the 1500 square kilometres surveyed in the Dookie region was affected by sheet and gully erosion.

The New South Wales Soil Conservation Service undertook a survey of the Eastern and Central Divisions between 1941 and 1943, discovering that over 2000 square kilometres of land was beyond economic reclamation due to gully erosion, and that almost half of the land area was affected by erosion to some extent.

In South Australia, the surveys of soil resources that had been commenced by the CSIR in the early 1920s continued in the pastoral and farming areas of the State.

This work drew attention to the fact that soil erosion was just a symptom of the more fundamental problem of the alteration of the hydrological balance by agricultural exploitation of the landscape.

Professor J. MacDonald Holmes of Sydney University also carried out a survey of soil erosion in Australia and New Zealand in the early 1940s. This recorded that, up until the time of publication in 1946, no soil erosion surveys had been carried out by State agencies in Queensland.

7.4.2 Amendments to the soil conservation acts

In the period of the post-war boom, soil erosion tended to lose its political visibility. As the newly formed instrumentalities got on with the job of research and extension, a number of problems were encountered that resulted in legislative responses with the aim of making the research and extension approach more effective.

New South Wales

By the mid-1940s, it was clear that the inability of landholders to invest in soil conservation works was an obstacle to the wider adoption of soil conservation practices. The Soil Conservation Act was amended in 1947 to allow for the Advances Scheme and the Plant Hire Scheme. The former made loans at concessionary rates available to landholders undertaking soil conservation works, and the latter set up a pool of machinery operated by the Soil Conservation Service and available for hire by landholders. These initiatives came to be a major part of the work of the Service in the post-war period and into the 1970s, with annual reports of the Service tending to measure its performance in terms of hours of bulldozer hire, the quantity of banks and waterways installed and the areas of gully erosion treated.

Further amendments were made in 1952, this time in response to concerns that foreshore erosion and overstocking were not being dealt with effectively, and that the methods of managing land that had been declared an erosion hazard were inadequate. This amendment made it possible for the Service to enter into agreements with, or serve notices on, landholders to undertake soil conservation works, or to change their management practices, including reducing stocking rates where overstocking was occurring. The setting of appropriate stocking rates was to be carried out by Assessment Boards.

While there had been legislative recognition of the need to deal with erosion on a catchment basis since the amendments of 1952, the first group scheme did not occur until 1965 in the Goorianawa Valley. Further amendments to the Soil Conservation Act in 1972 introduced the concept of protected lands with slopes greater than 18 degrees, on which the destruction of trees was prohibited. The amendment gave the Catchment Areas Protection Board the power to prepare maps defining protected lands and to issue orders requiring landholders to prevent or repair damage.

Victoria

One of the tasks set the Soil Conservation Board by the 1940 Soil Conservation Act was that it should, after a survey of soil erosion in Victoria, prepare a report on what further legislation was required. As mentioned above, there was only a number of fragmentary surveys undertaken. The Board reported to the Government in 1943, but its recommendations were generally ignored or only partially acted upon. Following pressure from the Board in 1946 and a Royal Commission into forest grazing in the same year which recommended the setting up of a Land Utilisation Authority, the Labor Government introduced the Soil Conservation and Land Utilisation Bill in

1947. The Bill, which contained some punitive provisions against landholders who failed to carry out works recommended by a Regional Advisory Committee, was vigorously opposed in the legislature, and passed but not proclaimed due to the defeat of the Labor Government. It was not until 1949 that a Bill of the same name and some similarity was introduced by the new government. The Soil Conservation and Land Utilisation Act of 1949 provided for the setting up of a Soil Conservation Authority, which replaced the Soil Conservation Board. The extension role of the Regional Advisory Committees was regarded as impracticable and was dropped from the Act.

In the late 1950s and early 1960s, the Authority pioneered a new approach which combined group extension with catchment planning in successfully bringing widespread erosion under control on the catchment of the proposed Eppalock Reservoir. Subsequent legislative amendments made it possible for the Minister to establish similar group conservation areas upon request by landholders.

In 1971, the Act was further amended to allow for an advances scheme similar to that in New South Wales.

South Australia

USA events were again to have an influence on Australian land resource management policy when, in 1945, the Soil Conservation Act of 1939 was amended to set up district soil conservation boards along the lines of those in the USA which had been reported as being an effective means of extension of the soil conservation message. The district soil conservation boards were to undertake investigations and educate landholders. In addition, the Minister's power to make orders to undertake soil conservation works was transferred to the district soil conservation boards.

The amendment also contained provisions that required landholders to give three months notice before undertaking clearing, and the Minister had the power to prohibit clearing if it was thought that it would cause soil erosion.

The Soil Conservation Act was amended again in 1960 to make it possible to partition soil conservation districts and to attempt to prevent wind erosion problems before they occurred. In this latter respect, the amendment used the approach of the 1923 Sand Drift Act, by making landholders responsible for any damage caused by inappropriate management practices on lands susceptible to wind erosion.

Queensland

The Soil Conservation Act of 1951 was repealed and replaced by an Act of the same name in 1965. The 1965 Act carried over some of the features of the 1951 Act that had been considered a success, such as the Advisory Committee. However, the new Act represented a fundamental shift in thinking towards local involvement in soil conservation. The Act allowed for the formation of soil conservation trusts that would be the administrative body for soil conservation districts declared by the Minister in areas of erosion hazard after application by local authorities and landholders. The trust would have the power to borrow money, undertake works, plan large scale soil conservation schemes and issue erosion correction notices to landholders.

7.4.3 Trends in the post-war period

A number of trends can be identified in soil conservation policy in the period from the passing of the soil conservation acts until the mid-1970s.

Firstly, the New South Wales Soil Conservation Service and the Victorian Soil Conservation Authority took on advisory and participatory roles in soil

conservation matters outside of agriculture. This was probably easier to do for the instrumentalities in New South Wales and Victoria where they were separate from the agriculture departments. The Service and the Authority provided advice to lands departments, forestry agencies, local government, and for major development projects such as the Snowy Mountains scheme.

Secondly, there was a slow progression through a number of different ways of seeing and responding to soil erosion problems. First there was a transition from seeing soil erosion problems as problems on individual farms to be treated on an individual basis after they occurred, to the view that it was possible to plan land use on the farm to avoid soil erosion in the first place. From this, the next step was to expand planning to a number of contiguous properties and coordinate any soil conservation works across these properties. Finally, there was the realisation that planning of land use and soil conservation works should ideally take place across whole sub-catchments.

Thirdly, the voluntarist approach was maintained throughout the period, with farm planning, finance and plant hire being made available at concessionary rates, with the establishment of demonstration farms, and with minimal use of the regulatory and punitive provisions that did exist in the legislation. The voluntarist approach of the period is remarkable for the differential application of economic assessment to policy choices. On the one hand, it was universally recognised that economic analysis of the costs and benefits of remedial works was an important part of determining whether individual farms would be able afford these works. On the other, the same analysis was never applied to the question as to whether the long term benefits of substantial public subsidy of remedial works would exceed the costs of this subsidy. In this respect, the experience with land resource management parallels that with water resource management.

While the post-war period was one of modest success in terms of the installation of soil conservation works, the rate of agricultural expansion and the potential for further land degradation problems overwhelmed the achievements of the State agencies. In New South Wales, the area under cropping expanded on the North West Slopes and South and Central Western Plains. The area subject to moderate gully erosion increased by 7700 square kilometres in the period from 1947 to 1967 — an increase attributed to the expansion of wheat growing. In Queensland for much of the post-war period, new land requiring soil conservation works was being brought into cultivation at twice the areal rate at which works were being completed on the existing stock of erosion affected lands. In South Australia, with a large program of soldier settlement in the south east, land was being cleared at three times the areal rate at which existing cropping lands were being treated with graded banks. Victoria, in contrast, did not experience the agricultural expansion in the other three States. However, for much of the period, the hidden water table rises in dryland areas were threatening large areas of the State, to come to political and public attention after a series of wet years in the 1970s.

7.5 Enter the Commonwealth

The Collaborative Study, commenced by the Commonwealth Government in 1974 (Department of Environment Housing and Community Development, 1978) marked the commencement of substantive Commonwealth involvement in land resource management policy. This is not to say that the Commonwealth had no involvement prior to this time. If continued government inaction in the face of pressure for action counts as policy, then it can be said that Commonwealth policy resulted in significant land degradation from the time of Federation.

A National Soil Erosion Bureau was discussed in the 1930s, but never

eventuated. Similar proposals emerged in the 1940s, and the Standing Committee on Soil Conservation dates from that time. However, its appeals for the Commonwealth to provide funds to the States for soil conservation measures were ignored for some 25 years.

However, and as Bradsen (1988) notes, because agricultural expansion was inevitably associated with land degradation, it can be said that virtually any Commonwealth policy that supported this expansion was also a policy that contributed to the magnitude of the land degradation problem identified by the Collaborative Study in 1978. Such support included taxation measures that favoured land clearing, support for soldier settlement and other large land development projects, and drought relief measures that provided an incentive for overgrazing. To these acts of commission can be added those of omission, largely the Government's failure to act upon the recommendations of a chain of inquiries, Royal Commissions and CSIR/CSIRO studies since the 1930s which made explicit the link between agricultural expansion into less favourable areas and land degradation problems.

The finding of the Collaborative Study that had a significant impact was the estimate that one half of the land area under agricultural use required treatment for land degradation, at a cost of \$675 million³³.

Some Commonwealth funds were made available to the States in the 1970s, and this was formalised with the establishment of the National Soil Conservation Program in the early 1980s. The goals of this Program were that:

- all lands be used within their capability,
- land use decisions be based on whole catchment planning concepts,
- all land users and levels of government meet their respective responsibilities,
- cooperation and coordination should occur between all sectors of the community involved, and

- the whole community should adopt a land conservation ethic.

7.6 State Policies in the 1980s

The Collaborative Study, and the more popular subsequent summary publication by Woods (1984), placed the State Governments under some pressure to improve their soil conservation performance. In New South Wales, the protected lands provisions were widened and strengthened in amendments to the Soil Conservation Act in 1978. In South Australia, amendments to that State's Soil Conservation Act made it easier for the Government to create soil conservation districts and increased the penalties for contravention of vegetation preservation orders. There appears to have been less legislative activity in Queensland and Victoria around the time of the Collaborative Study, although Queensland brought in substantial changes to its 1965 Act in 1986. These included the removal of the provisions for soil conservation districts and the associated trusts — these 1965 initiatives having received relatively minor use. The 1986 Act proposed that primary responsibility for soil conservation rested with landholders, while the role of the Government was leadership, coordination, extension and research.

An important feature of the 1980s was the rise of the concept of integrated catchment management. The concept was not a new one. As mentioned above, the soil conservation agencies had moved towards the concept of planning soil conservation works on a catchment basis during the post-war period. The concept was, in fact, embodied in Queensland legislation passed in 1943 — the Land and Water Resources Development Act — although the intent of this act was more directed to orderly closer settlement than environmental protection.

The First National Workshop on Integrated Catchment Management in 1985 did much to advance the cause of

integrated catchment management, with its recommendations being fully endorsed by the Australian Water Resources Council. In Victoria, where salinity had become politically visible during the 1980s, the Cain Government's salinity strategy 'Salt Action: Joint Action' included regional salinity planning based on integrated catchment management principles. New South Wales was the first State to institutionalise the concept, with the passing of the Total Catchment Management Act in 1989. This provided for Catchment Management Committees coordinated by a State Catchment Committee. As described below, integrated catchment went on to become a major focus of land resource management policy in the 1990s.

The second significant development during the 1980s was the growing interest in group extension in Victoria. From the late 1970s and through the 1980s an increasing number of farmer groups oriented to improved land management were established. These had varying degrees of government assistance — the Victorian LandCare groups of the mid-1980s, for example, received 10-50 per cent of their project costs from the government.

7.7 The 1990s

In the late 1980s and the early 1990s, the political visibility of rural environmental issues increased to levels commensurate with those in the 1930s and 1940s that had resulted in the passage of the soil conservation acts. A number of factors were involved:

- the media interest in the graphic imagery of the salt affected regions of Victoria that projected salinity,
- the Hawke Government's willingness to become involved in the resolution of environmental issues and its realisation that the environmental vote would make a significant difference to election outcomes, and

- the world-wide increase in environmental concern, partly caused by the publicity afforded the recently discovered ozone hole and the Greenhouse Effect.

The most significant outcome from this period was the joint proposal for a national landcare program put to the Hawke Government by the Australian Conservation Foundation and the National Farmers' Federation. This was to result in the announcement of the Decade of Landcare Program, together with a wide range of complementary initiatives, including the One Billion Trees and Save the Bush Programs, a National Reafforestation Program, the creation of the Land and Water Resources Research and Development Corporation and additional funding for the Natural Resources Management Strategy of the Murray-Darling Basin Commission. Landcare has continued to enjoy bipartisan political support throughout the 1990s, with apparently substantial increases³⁴ in the funding made available by the Commonwealth Government as a consequence of the sale of Telstra and the establishment of the National Heritage Trust (NHT) by the Howard Government. This brought a range of land management programs under its rubric, and moved towards a more interventionist Commonwealth role in the disbursement of funds by the States, achieved through partnership arrangements.

Landcare has become the most politically and publicly visible aspect of land resource management in the Basin in the 1990s. While the rapid growth in landcare groups to over 4000 groups by the end of the decade is one of the often mentioned consequences of landcare, there were a number of other consequences, most of which have been described in detail in the edited volume by Lockie and Vanclay (1997). These include:

- the re-alignment of State agency programs to take advantage of the NHT funding and the withdrawal of State

funding from land resource management,

- the incorporation of landcare into State catchment planning initiatives,
- the bureaucratisation of landcare that has led to disaffection among those who saw it as a community-based program,
- the formation of interest groups with a political agenda framed around landcare ideas and ideals.

Inevitably, this diversification of the concept has led to claims that landcare has lost its way and that the funding is not reaching the landholders that need it, nor achieving the environmental objectives of the program. Some support to these views has been provided by reviews and evaluations, such as the Australian National Audit Office review in 1997. By the end of the 20th century, with landcare membership rates of increase slowing down or reversing, it could be said that some of the early 1990s gloss has worn off, with no obvious harbingers of what might replace it in the first decade of the 21st century.

The second significant feature of the 1990s has been the growth of planning activities based around the concept of integrated catchment management. Following the Total Catchment Management Act in New South Wales in 1989, the Catchment and Land Protection Act in Victoria in 1994 replaced its Soil Conservation Act, and the Catchment Water Management Act was passed in South Australia in 1995. Queensland has had a catchment planning strategy since 1991. In addition to the State planning activities, there have been a number of Commonwealth-State planning initiatives relating to such things as rangelands management, biodiversity and the control of nutrient pollution and eutrophication in the Basin.

As Conacher and Conacher (2000) note, there has been a certain degree of convergence between catchment planning and traditional urban and regional planning. Catchment planning has come to give greater recognition to economic

development objectives and urban and regional planning is giving greater consideration to land management. An important difference, however, between the many land management-related plans and strategies of the 1990s and urban and regional planning is that the latter has a substantial regulatory basis to give effect to the plans that are produced. It is a matter of some concern that so much effort has been put into catchment planning and various land management-related strategies with so little regulatory potential for giving effect to these plans and strategies. A further concern is that integrated catchment management has received relatively little economic assessment as to the worth of its achievements compared to the not inconsiderable public funds it consumes. According to some (see, for example, Wilkinson and Barr, 1993; Marshall, 1998), the achievement of the changes in land use promulgated in catchment plans leaves much to be desired.

From a historical perspective, both the soil conservation acts of the mid-20th century and the upsurge in catchment planning in the late 20th century have followed upon

periods of popular and political concern about the environment. Both have also been underpinned by a voluntarist approach to obtaining the needed changes in land use — this being the only politically feasible approach in the face of the power of absolutist property rights rhetoric³⁵.

It remains to be seen whether the planning proliferation of the 1990s will be any more successful than the mid-20th century soil conservation acts in halting the agricultural damage to land resources in the Basin. The experience from the early salinity planning efforts in Victoria would suggest that, even if the planned land use changes fail to eventuate, the planning process itself and the associated community participation do raise community awareness to a degree that makes land degradation problems politically visible. This visibility can result in the allocation of public funding, often with little economic assessment as to whether the returns justify the expenditure, or as to which of the many candidates for expenditure will be the most cost effective.

8 Overview and Issues for Consideration

8.1 Overview

The main phases in the history of agriculture and natural resource management in the Murray-Darling Basin are depicted in figure 8.1, together with a selection of the key events that shaped, or were the outcome of, policy. The figure clearly shows the importance of the late 1960s and early 1970s as a policy watershed for agriculture in the Basin. During this period tariff protection began to be dismantled, Australia lost its preferential treatment in British markets, and industry efficiency replaced nation-building as the rationale for both water and farm policy. Interestingly, the one policy domain that did not experience such a sea change in policy-making was land resource policy. In fact, some trends in this area of policy since the late 1960s and early 1970s appear to be the opposite of those in farm and water policy. During the 1980s and 1990s farm and water policy, and public policy more generally, were characterised by the withdrawal of the involvement of the state in the provision of services to agriculture. In land resource policy, on the other hand, there appears to have been a growing involvement of the state in areas such as catchment planning and the administration of landcare.

The policy watershed of the late 1960s and early 1970s also marks the beginning of a period of greater diversity and experimentation in agricultural and resource management policy in the Basin. As Dovers(1999) has argued, there is little prospect for overcoming the policy *ad hocery* and amnesia of much of the 20th century unless this experimentation is backed up with the monitoring and evaluation of policy outcomes.

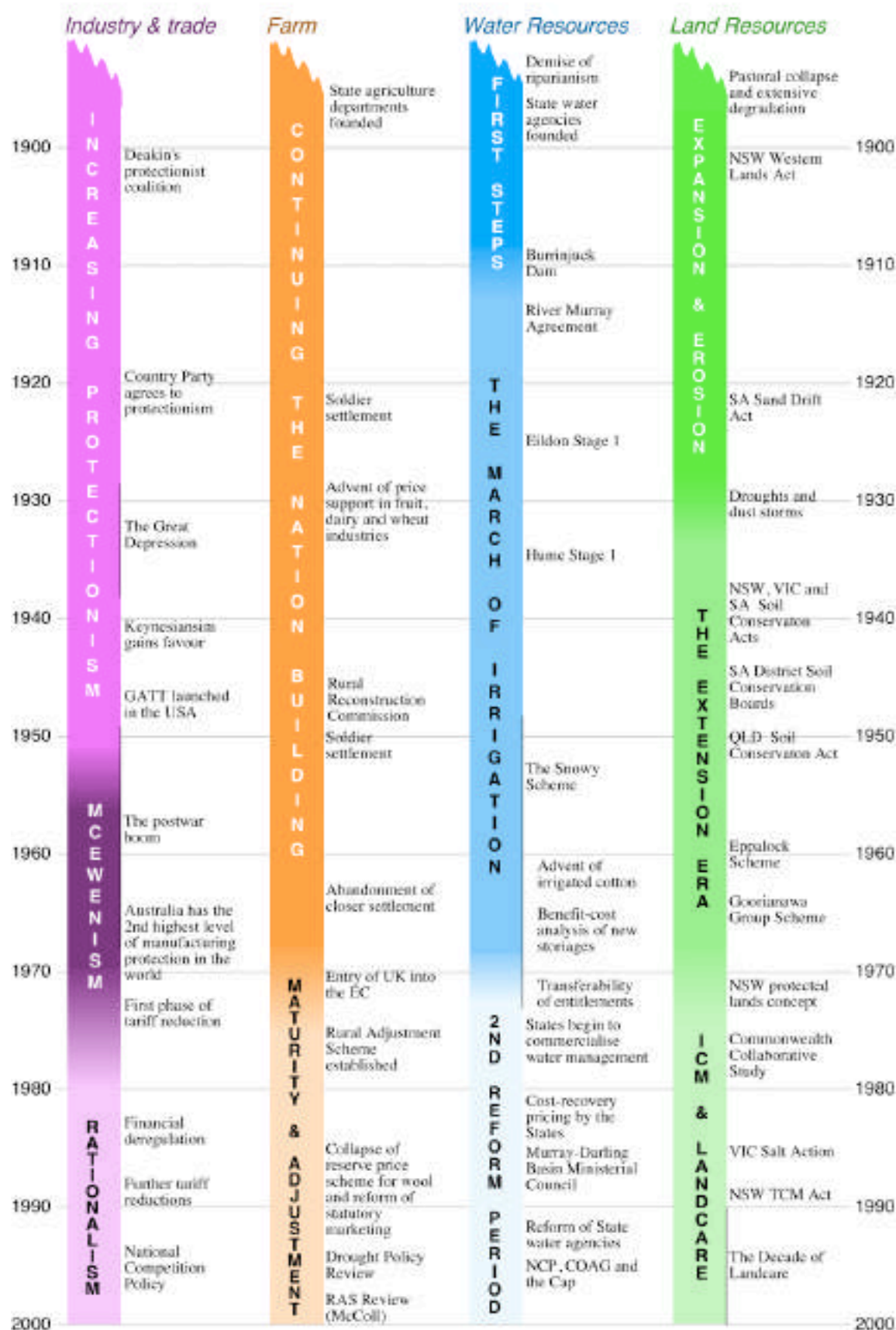
A pervasive influence on agriculture and natural resource management policy in the period prior to the watershed of the late 1960s and early 1970s was the conviction

held by those involved in policy-making that the expansion of agriculture and the populating of the interior could build a mighty nation like the USA. Misdirected as such a conviction might seem now, it was an understandable policy goal at the beginning of the 20th century, given Australia's proximity to a densely populated Asia, the apparent abundance of agricultural land and the importance of agriculture in national economies at that time. Furthermore, it was not obvious to early 20th century policy-makers that agriculture would make a declining contribution to the national economy in the future.

The nation-building rationale was, however, more than just a good idea at a particular time in history. Australian federalism has ensured its survival, albeit somewhat muted, to the present day. With the Commonwealth raising the bulk of taxation revenue, the States have been, and will continue to be, susceptible to supporting large speculative infrastructure projects which hold out the prospect of increasing revenues through the State tax base.

The nation-building rationale and the policies it spawned were responsible both for the successful agricultural innovations and adaptations that have enabled production from the Basin to increase for much of the 20th century, and for the failures that have visited considerable social costs upon the farming population and enormous damage to the environment. As Barr and Cary (1994) note, the agricultural settlement of the Australian interior, seen in retrospect, has been a grand national experiment. Both agriculture and policy have had to be adapted to the conditions of the Basin. The current land use in the Basin, and the attendant land degradation, reflect the successes and failures of experimentation.

Figure 8.1: Agricultural and Resource Management Policy in the Murray-Darling Basin



The current situation in the Basin is not only a reflection of past policy — it is also where future policy must seek opportunities for innovation. In this respect, as Barr et al. (2000) note, the aging irrigation infrastructure, the aging farm population and the sub-viability of a substantial proportion of farms all point to an approaching period of rapid adjustment in the Basin. This will provide opportunities for policy innovation and for integrated regional development policy that aims to achieve simultaneously economic, social and environmental goals³⁶.

In looking to future policy directions, it is inevitable that the light of policy inquiry may have to illuminate those sensitive and difficult issues that have mostly received little attention to date — issues that challenge both the policy norms of the 20th century and the special position agriculture has occupied. The following sections briefly discuss some of these issues, to the extent permitted by the necessarily brief overview in the previous chapters.

8.2 Farm Policy

The 20th century history of farm policy in the Basin points to two policy issues that are worthy of further consideration: the recognition of the central importance of human and social capital, and the need for a coherent rationale and a comprehensive framework for regional development.

8.2.1 *Human and social capital*

Changes in technology and social norms continually places new demands on the skills required by people in their chosen occupations. While conventional market processes can be relied upon to reward occupational competence, there are some situations where the social and environmental costs of incompetence are sufficiently high to warrant government intervention. Strict conditions on the educational qualifications of medical

practitioners is one example where the social costs of incompetent practice are too high to rely on financial failure as a means of weeding out incompetent practitioners. With the increasing recognition of the environmental costs of poor farming practice and of the crucial role of human capital in the growth and adaptability of farm businesses and industries, the occupational competence of those entering agriculture will become an important issue. Particular farming activities, such as the use of agricultural chemicals and explosives are already being regulated by accreditation procedures. Agriculture will need to continue its progression from a craft-based vocation to a modern profession in which participants have the skills to deal effectively with the increasing complexity of the several dimensions of its environment. These might include the need for people to be involved in non-farm occupations from time to time. The policy instruments for encouraging the flow of high quality human capital into the industry might include placing certain human capital hurdles on entry to the industry.

The recognition that industry adaptation and growth can be inhibited not only by failures of individual action but, increasingly, by failures of collective action, places greater focus on the need to build, maintain, and use the ‘social capital’ (groups, networks, and other relationships) amongst farmers, and between the farm sector and other relevant actors. The policy instruments for enhancing the building of the relevant social capital need to be examined more closely than has been the case in the past.

8.2.2 *Regional development*

In relation to the second of the two issues introduced above, there has in recent years been a growing understanding that the economic and social condition of rural regions depends on more than the prosperity of the farm sector. There has also been increasing recognition of the

declining contribution of the farm sector to regional economies. Rural regions are no longer seen as having value merely as the site for industries which exploit or extract natural resources, and their ancillary value-adding industries.

There is increasing recognition that agriculture will have a reduced (but still important) role in regional economic development, and that there is a need for governments to take a more active role in ensuring the flow of resources to regional economies. Recognition of the latter marks a transition from purely 'rationalist' policies which stressed the reform of national markets (product, finance, labour, etc.) via means such as competition policy. These policies assumed that improved regional economic well-being would follow from the reforms. While doubts have arisen about this assumption of 'rationalist' policies, rationality is still needed in regional development policy.

There needs to be a clearly stated and coherent rationale for governments' role in regional development, and the current mix of policies and programs, with their emphasis on the resources that rural communities themselves can contribute, may need to be augmented. In this context, it will be important not to allow the 'tail' of farm policy to wag the 'dog' of regional development policy.

8.3 Water Resources Policy

From the review of the history of water policy relating to the Basin, three observations suggest themselves. First, the water doctrine which replaced the riparian doctrine, while having its desirable features, is still an institution calculated to facilitate extractive water use. The arrangements replacing it need to provide a robust framework for arriving at the best mix of the range of jointly dependent services of the Basin's rivers, of which extractive use is but one. Further, they should be able to accommodate the uncertainties confronting the Basin's future. A

particular uncertainty is over the actual needs of the environment. As knowledge improves and the nature of these needs become better understood³⁷, so we may need to change the way in which water is allocated to the environment. The new water ownership arrangements should be able to accommodate future changes in environmental allocations. The facilitation of trade — the favoured approach to greater flexibility in the COAG framework, — will undoubtedly need to be supplemented with other approaches. In all cases, statute law will be important in the implementation of greater flexibility in the allocation of water to environmental and consumptive uses. The last decade of the 20th century has seen much legislative reform and innovation in water resource management and it will be important to make periodic assessments of these legislative developments.

Second, questions must be asked about the likely future structure of irrigation in the Basin. The history of the Basin suggests that probable continuation of environmental and economic concerns should not be dismissed, even if the all jurisdictions satisfy third tranche requirements. Such concerns include the worrying prospect of a radically different, and smaller, irrigation industry than is presently the case. This would have significant implications and should be addressed by responsible planners.

Finally, a broad overview of the history of water policy relating to the Basin shows the importance of cooperative federalism in dealing with challenges calling for major changes in policy direction. There have been at least four such occasions: the original River Murray Waters Agreement, the Snowy Scheme, the second Murray-Darling Basin Agreement and the COAG framework and the National Competition Policy. Throughout, as well, there has been an on-going history of the states adhering to the conditions of these various agreements and cooperating in their implementation. The need for such collaboration will continue. The history

also shows the importance of bureaucratic inertia in prolonging the resolution of conflicts and the part played by political leadership in bringing them to an end. More detailed study of this history of collaboration, inertia and political leadership could lead to the generalisations which might help lessen the reliance on serendipity to cope with change; and heighten the probability of more expeditious resolution of conflict and charting of the direction of new policy.

8.4 Land Resources Policy

With the benefit of hindsight, the history of land resource management policy in the Basin can be seen as a series of attempts — many imperfect, but some successful and some disastrous — to cope with the fundamental mismatch between 19th century European agriculture and the environment on which it was imposed. The key mismatch is hydrological — agriculture allows more runoff and groundwater accession than did the vegetation it replaced³⁸. The result has been erosion, degradation of the riverine environment and spreading salinity.

The economic adaptation of European agriculture to the Australian environment took place relatively rapidly — agriculture was economically viable within a few decades of settlement. Ecological adaptation has taken much longer. While scientific understanding of aspects of the mismatch and its symptoms emerged in the 19th century and continued through the 20th century, it was not until the 1940s that a concerted policy response occurred. Initially, the focus was on damage repair to protect the agricultural productivity of the Basin in the wake of unquestioned agricultural expansion into lands where the mismatch was even more severe. Subsequently, policy turned to damage prevention and the task of accommodating the increasing non-agricultural interests in the state of the rural environment. Policy innovation in this respect has taken place in the context of cooperative federalism

and has given rise to considerable diversity in approaches, none of which could claim on sober reflection to be spectacularly, or perhaps even moderately, successful in reducing land degradation³⁹.

There are two key differences between the paths taken by water policy and land resources policy since European settlement. Firstly, water policy made one relatively prompt adaptation to the Australian environment when policy makers abandoned the doctrine of riparian rights. This common law doctrine was the basic legal principle by which access to water was managed in Europe and North America. Secondly, in the latter part of the 20th century, water policy also responded relatively promptly to the sea change in public policy making when the Keynesianism and administrative rationalism⁴⁰ that had ascendancy from the 1930s to the 1960s was replaced by the economic rationalism of the late 20th century.

In contrast, land resources policy since European settlement has been much slower in achieving institutional adaptation to the Australian environment. Freehold land ownership, the basic institution by which access to land is managed, underwent some modification in the form of leasehold tenures to adapt to the conditions of the pastoral zone in the 19th century. However, as some have argued, there may be potential for further modification⁴¹.

Compared to the extent to which water policy has abandoned the administrative rationalism that underpinned it until the 1980s, land resources policy has increased its dependence on administrative rationalist approaches, particularly with the emergence of integrated catchment management in the 1980s and its expansion into broad scale regional resource planning during the 1990s. This raises the issue of whether the failure of economic rationalism to make inroads on the policy task of allocating and coordinating land resource use is an example of bureaucratic inertia that is

delaying market reforms, or a genuine reflection of the inappropriateness of market instruments to land resource allocation⁴².

Regardless of the reasons for the expansion in natural resource management planning, the question needs to be asked whether the investment of effort is well directed. After all, the best laid plans of agency catchment managers are frequently rendered ineffective by technological innovation and the operation of land and commodity markets. As future-oriented as planning might wish to be, it is generally difficult to predict the stresses that market forces and technological innovation will place on the environment. A further difficulty is the generally weak powers in catchment planning legislation to obtain landholder compliance with the plans that are produced.

An alternative to approaches based on expert planning by state agencies and/or regulatory compulsion is the concept of resource governance. This concept arose during the 1990s, and is perhaps best represented by the work of Elinor Ostrom (Ostrom, 1990). As used by Ostrom and others, the concept refers to the process by which collective decisions are made about access to natural resources when there is more than just a single government agency involved — when, for example, multiple agencies, interest groups and individuals take part in decisions. Resource governance involves decentralisation of resource management functions formerly

held by state agencies, and the sharing of the planning and decision making powers of state agencies with resource owners or users.

Where resource management problems are complex and span multiple jurisdictions, resource governance needs to be organised in a nested hierarchy of institutions in which decision-making powers are devolved to the lowest level at which they can be effectively carried out. Broader questions of policy, such as regional or national targets are resolved at the higher levels necessary to obtain representation of all the interests involved.

Some progress has been made towards a system of nested resource governance in Australia, although this has been more accidental than deliberate. The evolving institutions of resource management through cooperative federalism, such as the COAG water reforms are a possible model for the upper part of a nested resource governance hierarchy. Developments in landcare and participative local resource management point to the possibility of a hierarchy founded upon self-governance at the lower, district levels. The nature of the middle, regional levels of a nested resource governance hierarchy remains uncertain. Further policy analysis is urgently needed to canvass the possibilities for middle or regional level governance and how these might relate to the current concepts of integrated catchment management.

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10 End Notes

¹ This is not to say that party policy platforms are not important in understanding the evolution of public policy. To the contrary, party policy documents provide important insights into how political ideologies are adapted to accommodate emerging issues of public concern. However, for this overview study, it is only feasible to sketch the changes in actual actions taken by governments in the Basin.

² For a more comprehensive listing of policy instruments, see Dovers (2001) or Gunningham and Grabosky (1998).

³ The diagram below draws upon the accounts of policy processes in Lester (1995), Rushefsky (1995) and Kingdon (1995).

⁴ Some care has to be taken in assessing the landscape changes and readjustments resulting from the European settlement of Australia. On the one hand, some of the changes have undoubtedly been beneficial, particularly to agricultural production (see, for example, Dumsday and Uren, 1995 and Smith, 2000). On the other hand, many of the changes that are characterised as land degradation, such as dryland salinity, have the potential to seriously reduce the productivity of agriculture, as well as closing off profitable future options for new forms of agriculture or alternative land uses.

⁵ This section draws extensively on the account by Fenna (1998).

⁶ The Mabo case in 1992 established that native title, under certain conditions, survived the reception of British common law in Australia.

⁷ Conacher and Conacher (2000:284-286) and Bonyhady (2001), for example, document the winding back of public consultation provisions in the NSW Environmental Planning and Assessment Act of 1979 and the Victorian Planning and Environment Act of 1987. The trend in the actual numbers of people involved in participative activities is less clear. The 'Who Cares about the Environment' surveys undertaken by the New South Wales Environment Protection Authority in 1994, 1997 and 2000 showed that the proportion of people in New South Wales reporting that they had, in the last twelve months, 'Wr[itten] a letter or signed a petition or attended a meeting or made a report or complaint with the aim of improving the environment' remained constant at 36 per cent for all three surveys (NSW EPA, 2000).

⁸ The rise of participative rural resource management under the banner of landcare may be more apparent than real. A number of researchers studying the landcare phenomenon in Australia have argued that the language and practice of participation in landcare may be little more than a screen behind which the State resource management agencies continue to pursue their own agendas, and governments avoid politically difficult resource allocation issues (Lockie, 1997; Martin, 1997).

⁹ Irrigation and water resource management policy are dealt with in detail in chapter 6.

¹⁰ Nevertheless, the policy makers behind the competition policy reforms in Australia paid little regard to the impacts of the reforms on rural areas (Dumsday, 2001, *pers comm.*).

¹¹ While the overall population of the Basin is increasing (for example, by 5.9 per cent between the 1986 Census and the 1991 Census — Crabb, 1997), one change that continues to receive political attention is the decline in the number of farm establishments and farm families. For example, between 1986 and 1996, the number of farm establishments declined by 16.2 per cent, and the number of farm families by 24.4 per cent (Barr, *et al.*, 200).

¹² This latter provision is likely to remain a contested concept, with governments attempting to restrict the scope of events regarded as 'exceptional', and farmer interest groups attempting to expand it. While ever the iconic status of 'the bush' and Australia's climatic variability persists, governments will find it difficult to resist the calls for support at times of climatic extreme.

¹³ The riparian doctrine gives landholders conditional rights to access and rights to water contiguous with and adjoining their land (Tisdell et al, 2000). The doctrine, in effect, allows landholders to do what they wish with their (riparian) water, as long as they do not unreasonably interfere with other landholders by such use (Bates 2001). Experience has shown it to be more applicable to a situation of relatively more stable and plentiful supply than to situations such as those of Australia and the west of the United States (Davis 1968).

More generally, riparianism is inadequate, not just as a basis for the management of competition between productive users of water, it also falls far short of the provision of a sound basis for the management of the multiple and joint uses (including environmental services) of the resource. While the initiatives of the first phase of policy development addressed the former problem, the best part of a century was to elapse before a start was made on grappling with these wider issues.

¹⁴ Most farmers wanted irrigation water to be available as an insurance against drought and wanted to continue the land-extensive methods of wheat-sheep farming that they knew best. In addition, many chose not to build their farming routines around the regular use of irrigation water because they feared that heavy charges would be levied for the use of water. The 1896 Victorian *Royal Commission on Water Supply* found that many farmers were only enthusiastic about irrigation because they believed it would increase land values and enable them to sell out at higher prices and move on to new land. The Chaffey's, and the other Victorian irrigation trusts, were victims of this lukewarm enthusiasm for intensive farming: most of the land subdivided at Mildura was purchased by speculators or remained vacant. Farmers were not obliged to use and pay for the water that passed through their properties. In any case, engineering problems discouraged the regular use of irrigation water: the Chaffey's pumps were expensive to run and burrowing yabbies resulted in seepage from the ditches. In other irrigation areas the poor quality of dams made supplies unreliable. Finally, the Chaffey's did not pay much attention to the issue of the potential market for irrigated produce in Victoria, which was much smaller than in California. Neglect of this problem was a common fault amongst irrigation pioneers.

¹⁵ There is still some uncertainty about the nature of the first agency in New South Wales with responsibility for irrigation matters. Smith (1998) refers to the formation of a Water Conservation and Irrigation Board in 1896. However, research in progress by Katrina Proust at Australian National University suggests that a small section with responsibility for water conservation was established under the control of engineer Hugh McKinney in May 1887. This section was located at various times either within the Mines Department or the Public Works Department. It did not enjoy the same support as did its equivalent in Victoria, and McKinney devoted considerable effort to promoting irrigation. He left government employment in 1900 to promote irrigation development on the Murrumbidgee with Robert Gibson.

¹⁶ There were some successful private irrigation ventures, notably those of McCaughey who used water from the Murrumbidgee for irrigation purposes. By the end of the 19th century, McCaughey had about 60 miles of irrigation channels on his properties (Wilkinson 1997). N.A. Gatenby also conducted successful irrigation experiments on his property *Jemalong* on the Lachlan River from the 1890s (*NSW Agriculture Gazette*, 1903: 385-399).

¹⁷ A detailed account of the development of the Murrumbidgee Irrigation Scheme is given in Cowper (1987).

¹⁸ Alfred Deakin was particularly concerned, on the basis of his study of the Californian experience, by the potential the prior appropriation doctrine provided for the monopolization, by private interests, of bulk water services.

¹⁹ Ward (2000, p.27) describes this extensive involvement of the State Governments — ‘... developers of water supply infrastructure such as dams, and developers and owners of large-scale urban and rural supply schemes (including irrigation)’ — in the following way.

The deployment of this grand scheme received broad political and commensurate financial support and was facilitated by a well-established engineering hierarchy, responsible for the conceptualisation, planning and construction of dams and reticulated supply, drainage and sewerage systems. Additionally, the statutory

authorities responsible for supplying rural water progressively controlled the pattern of rural settlement, inclusive of farm size and crop types. The agency objectives and tasks, whilst large in magnitude and scale, were narrow in scope and comprehensively specified. With minimum political distraction, the achievement of specific hydraulic and engineering objectives was vigorously executed with high levels of technical expertise and utility. . . .there was no legislated obligation to consider external consequences, and the subsequent metric of rural water development was couched in engineering terms and measured accordingly. Although punctuated by the Depression and two World Wars, the pace of water development, particularly rural irrigation schemes, has continued unabated over the 100-year period initiated by Deakin's Irrigation Act of 1886

²⁰ While the data in Table 6.1 relate to the states as a whole, and therefore include dams constructed for urban supply, the conclusion that it reflects the rate of development in the Basin seems reasonable. In the 1990s, about 80 percent of water in Australia was used for rural purposes, and most of the irrigation in Basin States is located in the Basin.

²¹ Research in progress by Katrina Proust at the Australian National University suggests that the political support for irrigation in New South Wales may have lagged behind that in Victoria, at least in the last decade of the 19th century.

²² For example, the Victorian State Rivers and Water Supply Commission played a key role in implementing the policy of closer settlement, buying up properties, subdividing them into small holdings, and providing them with needed infrastructure (Powell 1989: 144-64). This was done to provide opportunities for the existing population to obtain farms of their own, although the head of the Commission, Elwood Mead, also saw the need to recruit immigrants from America and Europe who were experienced at farming on small holdings and could demonstrate the value of intensive cultivation to Australians. Mead also sought to encourage farmers to prepare their land for intensive cultivation by introducing a compulsory charge for irrigation water, levied as a rate on the value of the land, regardless of whether the water was used or not.

Mead argued that it was feasible for around one million acres in Northern Victoria to be irrigated, and that 'settled as it should be to secure the full benefits of irrigation this areas will support 200,000 more people than now live on it. ... To grade and improve this land, to build the houses, stables and fences required by the area, to equip the farms and handle the products from them would do more to increase trade and give added employment to labour than anything which has occurred since the discovery of gold' (Mead 1909: 490).

²³ The attempts to promote the canned and dried fruits industries in the MDB were a case in point. The completion of the Hume and Lake Victoria storages made a further 700,000 acres of irrigable land available and in the interwar period many growers had succeeded in laying out sound and productive orchards and vineyards. The Victorian government provided financial assistance for the establishment of canneries to assist overseas marketing and avoid seasonal gluts (Shiel 1981). The Shepparton Fruit Preserving Co. was established in 1918 and co-operatives were established at Mooroopna in 1921 and Kyabram in 1922. These firms struggled to compete in overseas markets because of high production costs and 'the world over-production of canning varieties of fruit' (Development and Migration Commission 1929). The Australian Dried Fruits Association, formed in 1907 after a merger of various packing and marketing co-operatives, was at first a success story, but by 1925 world markets for the product had become glutted and it was reported that only growers with high yielding blocks were covering production costs (Director of Development 1929-30-31).

²⁴ Following successful trials in the MIA in 1922-23, rice was rapidly accepted in the economically stressed region. In 1940, it was reported to be the most profitable crop in the Area (Wilkinson 1997). Cultivation of the crop expanded to other areas in the south of the State, particularly during World War II. By 1984, the Minister for Agriculture declared that, in the south-west of the State, rice had become 'the backbone of the system of irrigation areas and districts' (Wilkinson 1997). In 1981/82, 64 percent of irrigation water in southern New South Wales Irrigation Districts was used on rice (Wilkinson 1997).

Lloyd (1988 p.214) refers to the importance of this new, profitable crop to the larger farms resulting from the consolidations and rationalizations following the economic difficulties of the early days in the MIA. He also refers to the problems arising from the spread of the crop to the irrigation districts which lacked drainage (Lloyd 1988 p.248). Indeed, this was also a problem in the drained irrigation areas. Rice was cause for concern, as waterlogging and salinisation problems started to manifest themselves throughout the irrigation areas and districts, though Lloyd does point out that the crop was not solely to blame for these emerging environmental problems. He states that some waterlogging and salinisation were to be expected, even if the crop was not grown (Lloyd 1988 p.288).

²⁵ Diversion of the waters of the Snowy River had been suggested since the mid-1800s (Lloyd 1988). The idea gained fresh momentum, in the 1940s when New South Wales and Victoria proposed conflicting schemes. The Commonwealth became actively involved when, in 1948, it established a technical committee, the Commonwealth and States Snowy River Committee, to look further into the matter. With Prime Minister Chifley showing enthusiasm for the Scheme, the Committee recommended a compromise plan for a diversion scheme which could generate 2,820,000 KW of electricity and provide an average of 2,300,000 acre feet of water each year for irrigation. The water was to be divided between the two States. The recommendation was accepted and, after 25 years, the Scheme was completed in 1974, at an estimated cost of \$819 million in 1974 dollars, or around \$5 billion in 1990s dollars (Wikinson 1997).

²⁶ As an example, Powell (1989 p236) provides a quote from a 1963 issue of the *Current Affairs Bulletin*, as follows:

. . .there are few uses to which this water can be put that will yield anything of a satisfactory return on the necessary capital investment needed for reticulation and farm establishment, let alone the great capital works required for headwater storages. In most possible avenues, the increased production from the irrigated areas, which would lead to greater volume of material entering the markets, is likely to diminish returns received by farmers already established either locally or elsewhere in Australia. This is the fundamental reason why expected gross returns from irrigation expansion provide no adequate measure of the benefits likely to accrue from such an operation. By over-supplying the markets they could bring depression to broad areas of agricultural Australia. Local gain, at present debatable enough, could add up to major national loss.

²⁷ In the event, the Coleambally Irrigation Area, which was established in the 1960s to use the Snowy water in New South Wales, was never completed. Further, in order to enable them to become established, the new farmers were permitted to grow rice, but on an interim basis. Today, over 30 years later, the Coleambally continues to be a major rice producer.

²⁸ Ward (2000) summarizes the argument of Davidson and others as follows:

Davidson . . . criticised the level of government expenditures on irrigation schemes, based on a thesis that drought proofing and the irrigation solution were fundamentally ill-founded and misconceived. The extant competitive advantage for Australian agriculture is founded on a high ratio of naturally well-watered land per capita. Successful agricultural enterprise was predicated on the utilisation of large tracts of cheap land, the use of low levels of labour and the production of a relatively durable export commodity. Irrigation as posited by Davidson was the antithesis of a successful Australian farming system predicated on that natural advantage. Irrigation required smaller parcels of land and was labour intensive. Davidson's examination of the accounting detail of irrigated farming budgets indicated a bleak picture for individual operators and that extensive irrigation development was economically irresponsible

(Ward 2000 p.28).

Davidson argued that these fundamentally ill-founded policies were the root cause of the inability of irrigators to pay the full cost of the supply of water. The arguments of Davidson were expanded by others. For example, Paterson (1987) estimated that, based on economic criteria, only 12 percent of irrigation land in 1987 would have been developed and only 30 percent of the infrastructure constructed. Others produced a range of estimates of the size of the subsidy to the irrigation industry. Such estimates added to concern over the efficiency of irrigation, the further concern that, now that the 'national development' bubble was burst, the provision of such subsidies to new developments was inequitable.

²⁹ It can be argued that these concerns are not well-founded. However, only when these social and environmental impacts emerge (or fail to emerge) in the years following the reforms, will it be possible to make an assessment as to whether the concerns were justified.

³⁰ Langford et al (1999) refer to the influence of unsustainable public sector debt on irrigation reform in Victoria. This could be some explanation for Victoria becoming a leader in water reform.

³¹ Two-part tariffs are used by utilities to charge for the supply of services such as water, gas or electricity. A two-part tariff comprises an access component which is fixed independently of the quantity supplied, and a consumption component which is based on the quantity supplied.

³² This and subsequent sections draw heavily upon the accounts of Reeve (1988), Bradsen (1988) and Conacher and Conacher (2000).

³³ The estimate of one half was subsequently questioned — see, for example, Dumsday (1987:318).

³⁴ The actual extent of increase of funding is very difficult to determine, given the reorganisation and ‘rebadging’ of Commonwealth programs, and the withdrawal of State funding.

³⁵ Absolutist property rights rhetoric refers to the claims made by owners of freehold land to an unfettered right to use their land as they see fit, despite the fact that the state has historically imposed limits on these rights. Over time, the nature and concept of property has varied from an hierarchical system of social obligation of feudalism, to the absolutist possession as described by Blackstone (1783) that underpinned the rise of market capitalism and the industrial revolution, to the modern fragmentation of the bundle of property rights inhering in land ownership and increasing restriction on some parts of the bundle (Macpherson, 1975, Grey, 1980). The absolutist view of land ownership has survived in rural Australia well beyond its origins in the circumstances of Australia's settlement by Europeans (Bradsen, 1988:3; Voyce, 1996). It emerges from time to time in rural Australia when rural land owners feel threatened by the actions of the state or other claimants. Absolutist rhetoric has been in some instances backed up pre-emptive threats or actions to thwart legislative intentions, as occurred in South Australia when the State Government attempted to restrict the rights of land owners to remove native vegetation (Bonyhady, 1992:57). Bonyhady further pointed to a range of environmental legislation in which the land owner's consent was required before restrictions on the owners' property rights could be imposed in the public interest. Despite such factors that might prevent restrictions on property rights, the property rights associated with land ownership in rural Australia have nevertheless experienced considerable restriction by statute law, such as the removal of rights of land owners to minerals and wildlife (Bradsen, 1988; Bonyhady, 1992). Fowler (1984 :196) in his review of the South Australian legislation that impacted on land ownership, concluded that freehold land ownership in that State had always been subject to regulation and that the amount of regulation was likely to increase in the future.

³⁶ The Rural Partnership Program in the mid-1990s made some advances in integrating regional development policy. The lessons from this program may be worth revisiting in the context of adjustment policy for the Murray-Darling Basin.

³⁷ An example is the recent improvement of our understanding of the impact of cold water discharges from dams on downstream fish populations.

³⁸ Australian agriculture is also ‘leaky’ with respect to its use of nutrients, although nutrient pollution is just as much a problem in European and North American agricultural environments.

³⁹ From a historical perspective, the question has to be asked as to whether the landscape transitions that have been labelled as land degradation are inevitable if agriculture is to be practiced in the suitable parts of the continent. It is certainly unrealistic to expect that the widespread practice of agriculture, with its different hydrological characteristics, will not result in some adjustments in the landscape. There is little doubt that these adjustments may reduce the longer term productivity of agriculture, or non-agricultural values such as biodiversity and urban water supply. The key question is how much remedial and preventative expenditure is justified by actual pass losses and potential future losses.

⁴⁰ The administrative rationalist approach assumes that good natural resource decision-making is done by the application of science. Modelling and planning is expected to uncover the best way of allocating natural resources. Administrative rationalism also assumes that facts and values can be separated, and that only the former, and never the latter, should enter into decision-making. The scientific values of objectivity, precision and repeatability are important in administrative rationalism. Also important are the administrative values of clear specification of objectives, evaluation of performance and accountability. Integrated catchment management without its participative dimension is a fine example of administrative rationalism in action.

⁴¹ The view that leasehold tenures provide a useful means of allowing governments to ensure private land use decisions accord with public interest goals is by no means universally accepted. The free market environmentalist position (see, for example, Anderson and Leal, 1991), has a pessimistic assessment of the ability of bureaucracies to identify and act for the public interest, and an optimistic assessment of the ability of markets and absolute freehold land ownership to deliver environmentally desirable outcomes. This optimism is not necessarily always well-founded for, as Jacobs (1991) and Eckersley (1995) have pointed out, the weak political commitment, inadequate resourcing and weak monitoring and enforcement that are claimed as causing the failure of direct environmental regulation by bureaucracies, may equally well cause the failure of the regulatory framework that is necessary to support the functioning of markets so that they behave in a way that approximates theoretical ideals.

⁴² The balance to be struck in any resource allocation problem between allocation by planning and administration (often labelled with the perjorative term ‘command and control’) and allocation by markets will inevitably remain a contentious issue. The allocation of land resources among the members of society who wish to use those resources for their benefit is no exception. On the one hand, the free market environmentalist position sees no role for planning and administration, holding that market forces will bring about desirable environmental outcomes. On the other hand, Walker (1999), building on an argument of Lowi (1964) suggests that increased planning and administration is inevitable as land resources are fully developed. In the frontier economy of the past, agricultural land use occupied a smaller fraction of the land area. This and the simpler technologies meant that the potential for the activities of one land owner to impact on another was very limited. Consequently, there was little need for the state to intervene in the activities of land owners. In a mature and modern agricultural economy, agricultural land uses dominate the landscape and modern technologies increase the potential for the activities on land owners to impact on each other (the growth of spray drift problems is an example). As a result, the amount of regulation by the state to maintain social order has to increase.