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ENCOUNTERING THE SOUTH AUSTRALIAN LANDSCAPE: EARLY EUROPEAN MISCONCEPTIONS AND OUR PRESENT WATER PROBLEMS

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ENCOUNTERING THE SOUTH AUSTRALIAN LANDSCAPE: EARLY EUROPEAN MISCONCEPTIONS AND OUR PRESENT WATER PROBLEMS

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INTRODUCTION

The basic requirement for all human activities is water. All civilisations have collectively managed water to achieve security. The traditional approach to water management in the last 200 years in the West involved a sectoral approach. Water was managed to service the cities with potable water and also to provide food security through irrigation, which uses up to 80 per cent of all water in most nations. The traditional approach was characterised by dams and other works that disregarded the ecology and environment and a suppressive approach to some sectors of the human economy.[1] In other words the approach was one of dominion rather than stewardship.

Only recently have issues of the sustainability of water developments been raised. In Australia the issue has arisen in part because of apparent cases of ecological damage such as algal blooms on the Murray and salinity of water and land and in part as a result of community support for environmental conservation which crystallised in the 1980s.[2] There are divergent views in the Australian community on the most desirable path to water security, not only between the agricultural and urban communities but also between other communities such as environmental conservationists, economic rationalists and within academia and the private sector. Finally there are inadequate processes and procedures in all Australian governments (state and federal) to deal with these conflicts. However, the situation is improving but there are structural impediments such as introspective state powers, competition between states and between the economic sectors of some states, lack of federal direction, lack of federal power and the short periods of government tenure (mostly three years in the states and the federal parliament).[3]

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* Professor of Business Law, Director of the Water Policy and Law Group and part-time Water Resources Commissioner on the Environmental Development Court of SA. This paper is based on a lecture given in the 'Encounters: cultural and scientific legacies and visions' public lecture series presented by the Hawke Institute and the Hawke Centre, Brookman Hall, Adelaide, 27 March 2002.

1 For example, slaves were used to construct dams. See N Smith, *A history of dams*, Citadel, New York, 1972.

2 See the discussion of the *Tasmanian Dams case* below.

3 The present Prime Minister John Howard is interested in extending the life of federal parliament to four years but this would need to be voted on at the next

Water management is indeed the issue of the new millennium.

> The art and practice of equitable distribution of and access to freshwater for all people in the 21st century, as a fundamental human right and international obligation, is the mother of all ethical questions of all trans-boundary natural resources of a finite nature.[4]

We as a nation have to institute better regulatory structures to manage the supply and demand of water in new ways. Part of the problem lies with the changed nature of the demand. This is illustrated by this quotation:

> Most civilisations and organisations practice laws and beliefs which impact on our water habits today and derive from a period before the population of the world began to double within a human lifespan.[5]

WORLD AND AUSTRALIAN WATER SUPPLY

In the world at present, five billion people have water; one billion do not. Three billion have sanitation; three billion do not. One child in the world dies of a water-related disease every fifteen minutes.

Only 2.5 per cent of the world's water is not salty and two thirds of that is locked in ice caps and glaciers. Of what is left, about 20 per cent is in remote areas and much of the rest arrives at the wrong time and place as monsoons and floods. Humans have available less than 0.08 per cent of all the Earth's water. Yet over the

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federal election. Business claims four-year terms would promote more substantial reform programs: *Australian Financial Review*, 11 April 2002, p 7.

4 Thomas Odhiambo, African Academy of Sciences, and vice-chairperson of COMEST (World Commission on the Ethics of Scientific Knowledge and Technology, established by UNESCO), closing address to the First Session of the COMEST, Oslo, April 1999.

5 Margaret Catley Carson and William Cosgrove, *It's not just water departments: getting a fix on institutions: draft report on world water scenarios*, World Water Council, 2001. The World Water Council held the first World Water Forum in Marrakech, Morocco in 1997 and called for a world water vision to bring about the sustainable development of water resources. This meeting and one in Delft prepared the World Water Vision, which developed a project to finance large-scale regional and network consultations. Directors were hired in 1998 and later meetings have taken place notably in Sweden. The Vision Management Unit is located in Paris at the Water Services Division of UNESCO. The 3rd World Water Forum is in Kyoto, Shiga and Osaka, Japan in March 2003, Tokyo in 2003 after a meeting in Bonn and the Rio +10 meeting in Johannesberg in September 2002. The fourth forum is planned to be in Montreal in March 2006.

next two decades our use is estimated to increase by about 40 per cent.[6] At present all over the world and here in Australia we use 70 per cent of water in agriculture but by 2020 we shall need 17 per cent more water than is available just to feed the world.

This paper will present an overview of the perceptions of water supply guiding the development of laws and policies in South Australia from the encounter period to the present day. It will examine native title issues, look at details of SA water management history and then move on to contemporary issues, suggesting a better regulatory model to cope with the multiple components relevant to modern water management.

The paper demonstrates that perceptions were flawed hydrologically, ecologically and economically in the early days and still are flawed. The policies have also been flawed, as evidenced by the environmental problems of salinity and algal blooms and also by the issues associated with rural poverty. All policies the world over have been flawed because they were unidimensional, expressing the domination theory, that is that people dominate nature. Recently the stewardship approach has had more sway (partly because of the environmental costs). The stewardship approach is more complex as it requires more factors to be considered and competing demands must be reconciled.

In Australia of late these factors have been added into the water management stewardship equation:

- indigenous issues
- salinity
- blue green algae
- global warming
- full cost recovery
- water markets and property rights to water independent of land
- the cap on water use in the Murray-Darling Basin
- changes to past water allocation practices, raising the issue of compensation
- incorporation of private sector providers with attendant issues of corporate governance[7] when involved in the management of a resource some see as a gift from God

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6 Alex Kirby, Environmental Correspondent, BBC, citing figures from United National Environmental Program and World Water Council at http://www.waterdesalination.com/worldwatershortage.htm.

7 Corporate governance and business ethics have been the subject of community concern in the UK and in Australia since the corporate excesses of the 1980s. See I Jones and MG Pollitt, *Who influences debates in business ethics? An investigation into the development of corporate governance in the UK since 1990*, Centre for Business Research, Cambridge, 1999; and JM McKay, *Classification of Australian*

- intergenerational equity
- sustainable livelihoods for the rural sector
- increased competition from other world suppliers.

Overall the issue of water management is becoming more complex and we need a radical change in regulatory and institutional arrangements to manage this. In many regards Australia is still a lucky country. We have a relatively highly educated rural sector and relatively few intra-ethic disputes. Hence we are well placed to create a water management regime that works.

REGULATORY MODELS IN AUSTRALIAN WATER MANAGEMENT

Australia has a literary metaphor for the concepts governing water development in the early years: the magic pudding. *The Magic Pudding* was written in 1918 by Norman Lindsay, who incidentally lived in South Australia for some time. Lindsay wrote: 'A peculiar thing about the puddin' was that, though they had all had a great many slices off him, there was no sign of the place whence the slices had been cut off. The custodians of the puddin' Sam Sawnoff, Bill Barnacle and Bunyip Bluegum were always on guard in case it should run away or be stolen by puddin' thieves.'[8] Today the pudding thieves will be seen by some in the agricultural sector as those trying to modernise and create environmentally sound policies for water allocation. These new policies will need to include the factors listed above and hence will inevitably result in reductions in water allocated. The broadest notion of social justice will be served by revising these old policies. Unfortunately there was little social justice in the original allocations and the methods used, so change is correspondingly difficult. For example, in SA one method used was the 'first come first served' method of allocation of water resources to growers in the South East of SA.[9] This has now changed in the last twenty years to reflect environmental issues with permissible annual volumes specified and allocation of water based on crop water requirements for non-stressed plants. The change has not been without critics and court challenges.

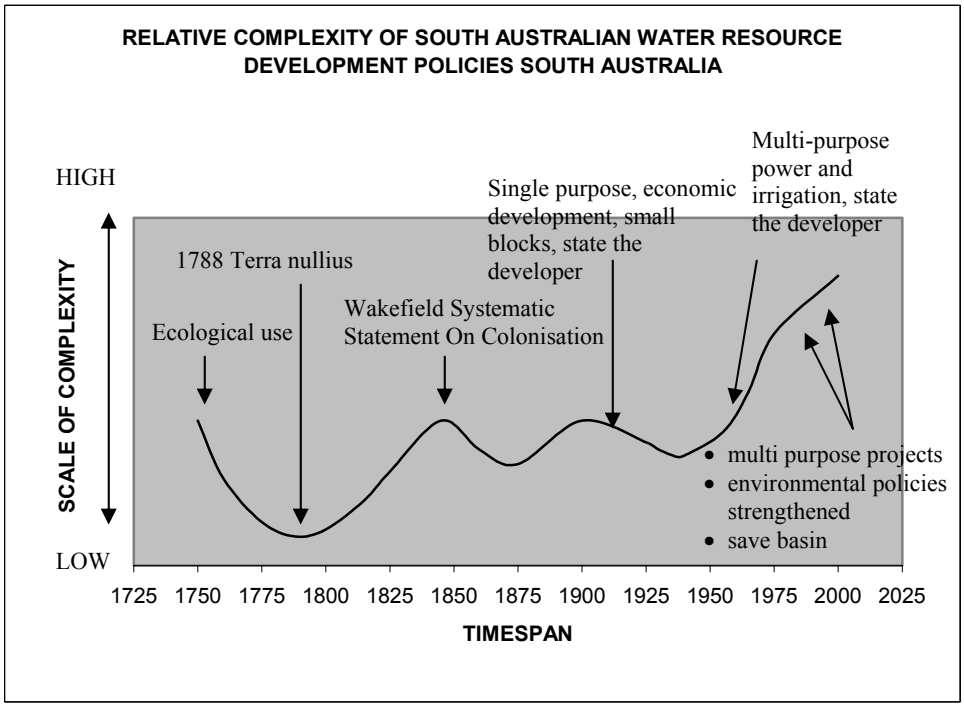
Regulation and regulatory models have been the object of much discussion in the academic literature since the 1970s. Institutions determine how we do business and they embody the incentives that shape opportunities. Institutions are made up of formal and informal laws, rules and cultural processes that are embedded in cultural mores.

Corporate and Industry-Based Codes of Conduct, International Business Lawyer, pp 507–514.

8 Norman Lindsay, *The magic pudding: being the adventures of Bunyip Bluegum and his friends Bill Barnacle and Sam Sawnoff*, Angus and Robertson, Sydney, 1918.

9 H Hopton, 'Water allocation in the South East of South Australia', Australian National Committee on Irrigation and Drainage Conference, 1999, p 10.

Figure 1



Water regulation in Australia is shaped by legal pluralism. This term is used to describe the fact that in democracies like Australia the laws that govern water and other issues are

> subject to the differing requirements of multiple heterogeneous groups. Neither the law nor legal or regulatory institutions are one system even in each State. The institutions exist within a state of legal pluralism within which groups may support, complement, ignore or frustrate each other. The law that is actually effective is a combination of complex and in practice unpredictable patterns of competition, interaction, negotiation and isolationism.[10]

Many water resources projects, though technically and economically well-conceived, have been hampered, retarded or doomed to failure as a consequence of inadequate water legislation[11] and also inadequate environmental knowledge.

10 Griffiths, 'What is legal pluralism?' *Journal of Legal Education,* vol 23, 1986, pp 1–55.

11 D Caponera, *Principles of water law and administration: national and international*, Balkena, Rotterdam, 1992.

Indeed, the academic literature has pointed out that regulation, far from curing unfortunate allocative consequences of market failure, may actually engender more resource misallocation than it cures.[12] Indeed the economic approach to political behaviour has frequently been said to imply that producers rather than consumers gain from legislation, that legislation does not promote general welfare because it is captured by the producers. That is, politicians are self-interested maximisers who influence the regulatory process.

However, capture may be a bit simplistic as we all know of instances in which a vocal minority has not been muted. Legislation can actually lead public opinion on some issues such as wearing seat belts. Also the capture theory implies that legislation always has the expected effect. In many ways this positive approach ignores a more compelling reality. All complex social problems have many dimensions and it is glib to be too critical of historical solutions. Indeed the whole process of public policy making has been regarded as 'muddling through'. The famous article 'The science of muddling through' was written by Lindblom in 1959[13] and pointed out that the ideal way to make any policy decision can never be achieved because of lack of time, historical information, intellectual capacity and resources. Others may more politely call this a co-evolutionary process.[14] This muddling through approach is compounded in Australia by the introduction of private water providers. This is because the whole concept of corporate governance is still unclear in Australia: does it involve only shareholders and managers or all stakeholders?[15]

More recent Australian authors have said that environmental policy decisions are best seen as experiments rather than confident predictions.[16] Maybe the solution rests with a truly adaptive management approach. This is described by Gellmann:

> [The] common feature [of all these processes is] that in each one a complex adaptive acquires information about its environment, identifies regularities in that information, condensing those regularities into a kind of scheme or model, and acting upon the real

12 S Peltzman, 'Toward a more general theory of regulation', *Journal of Law and Economics,* vol 19, 1976, pp 211–230.

13 H Lindblom, 'The science of muddling through', *Public Administration Review*, vol 19, 1959, pp 79–89.

14 P Jeffrey, M Lemon and Jefferson, 'My land, my water, your problem: coevolutionary processes and the development of appropriate water policy tools', Water History Conference, Bergen, Norway, June 2001.

15 J Hill, 'Deconstructing Sunbeam: contemporary issues in corporate governance', *Companies and Securities Law Journal,* vol 17, 1999, pp 288–302.

16 S Dovers and C Mobbs, 'An alluring prospect: ecology and the requirements of adaptive management' in B Klomp (ed), *Frontiers in ecology*, Elsevier, Netherlands, 1997.

> world on the basis of that schemata. In each case, there are various competing schemata, and the results of this action in the real world feedback to influence the competition between those schemata.[17]

The development of Australian water resources has never been a steady process but one marked by failures and successes of a physical, environmental, technological, institutional and political kind.[18] At present we are in a phase characterised by changes from the public structure of water management to corporatisation. See figure 1. Australia is in the process of re-establishing its regulations and institutions from public sector to public–private mix. This is a complex task which is being driven by the worldwide trend toward globalisation. There seems to be a lot of confusion and a lack of information plus the introspective legacy of the state water regimes. All of these, Lindblom would say, could be expected. The incentive pattern has also changed. As has been observed in Latin America,

> Water supply is a classic case of a local natural monopoly … private ownership does not make the natural monopoly go away. Simply converting a public monopoly to a private one provided few if any incentives to reduce costs. Innovate, invest to the efficient level and respond to consumer demands.[19]

The primary perception in urban Australia now is that it is important to preserve the fragile water environment. Hence sustainable management is required. New institutions and regulations are being developed, and multiple elements, including improved technology, are being applied in an attempt to redress the economic, environmental and social issues of water use in Australia.[20]

Aldo Leopold said in 1930: 'The greatest discovery of the twentieth century will not be radio or television but the fragility of the ecosystem.'[21] But misperceptions

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17 H Gellmann, *The quark and the jaguar: adventures in the simple and the complex*, Little Brown and Co, London, 1994.

18 Michael Johnson and Stephen Rix (eds), *Water in Australia: managing economic, environmental and community reforms*, Pluto Press, Leichhardt, NSW, 1993.

19 Jouravlev, *Water utility regulation: issues and options for Latin America and the Caribbean*, World Bank, Washington, 2000.

20 E Willett (ed), *The introduction and implementation of competition reform to the Australian water sector*, AGPS, Canberra, 1999, p 1: 'Water reform is an area that extends beyond competition policy matters to embrace social policy issues such as recognising the environment as a legitimate user of water. The Council has said that full implementation of the reform package could do more to benefit the broad community than any other NCP matter.' The other matters included gas, electricity and road transport reform.

21 Aldo Leopold, *Sand County Alamanac*, Acorn Naturalist Publisher, Wild River, USA, 1930. There have been countless editions of this classic work; it is one of the seminal writings that energised a resurgence of interest in working in harmony

still exist. What is sustainable management? There is still confusion between sustainable growth (an oxymoron)[22] and sustainable development. Sustainable growth is an impossibility as it is not possible for the world economy to grow itself out of poverty and environmental degradation. In its physical dimension the economy is an open subsystem of the earth's ecosystem, which is finite, non-growing and materially closed. 'Grow' means increase naturally in size by the addition of material through assimilation or accretion. To 'develop' means to expand or release the potentialities of, to bring gradually to a fuller, greater or better state. The earth's ecosystem develops but it does not grow. So sustainable development means operating within the assimilative capacities of the ecosystem.

As Charles Darwin said, 'if the misery of our poor be caused by our institutions, great is our sin'.

WATER MANAGEMENT IN SOUTH AUSTRALIA FROM ENCOUNTER TO 2002

I will present a chronological outline of the major water perceptions and regulations in South Australia and Australia. These are summarised in figure 1 above but the following sections will provide more detail. I will provide some narratives to illustrate the perceptions and the regulatory response and relate these to present water policy issues.

Figure 2: Timeline of major water regulations and perceptions in South Australia

pre 1788 few tangible impressions of water use but many of land use, ie fire stick farming. Economic and spiritual connections to water remnant in language.

1788 early exploration

- legal ruling of terra nullius therefore no indigenous water issues
- hope of an inland delta

1800 colonial governments' exploitation of water

- magic pudding
- rain follows the plough
- water can be managed in isolation
- water is a free good
- the desert will bloom
- social values are fixed and promote development

with the land. In a series of astonishing portraits of the natural world, Leopold created a stunning tribute to the land and a bold challenge to preserve it.

22 Herman Daly and Kenneth Townsend (eds), *Valuing the earth: economics, ecology and ethics*, MIT Press, Cambridge, Mass, 1993.

- unregulated usurpation of resources in the south to north frontier settlement[23]

1836 settlement of SA
- exploration
- Goyder
- Wakefield scheme

1901 section 100 of the Constitution gives power to the states over irrigation
- technological developments will solve the problems
- water management is mainly for technical experts
- environment is not seen as an issue
- enough data exists on rainfall and runoff
- colonial socialism[24]

1970 recognition of environmental water issues
- Commonwealth uses section 96 of the Constitution to direct states
- environmental awareness

1990s exogenous factors

1992 Mabo case overturned doctrine of terra nullius and opened the way for native title claims affecting water

1992 Intergovernmental Agreement on the Environment precautionary principle

1993 Commonwealth *Native Title Act* allowed freshwater claims

1994 Council of Australian Governments reforms: strategic framework for water reform

1994 Bureau of Meteorology revises probable maximum precipitation estimates for Australia

1995 water reform framework brought within National Competition Policy
- market will allocate water to improve efficiency
- consumption based on two-part tariffs: urban 1998, rural 2001
- full cost recovery
- separate identification and funding of community service obligations
- trading in rural water entitlements
- allocation of water for the environment
- broader social values embraced
- tenuous and vague objectives in the present Acts, making implementation difficult
- principle of subsidiarity, ie management of resources at level closest to user. Unless community consultation is managed this does not result in better decisions.[25]

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23 M Langdon, *Briefing papers: Indigenous rights to waters*, ATSIC and Lingiari Foundation, Melbourne, 2002, p 45.

24 See Timothy Doyle and Aynsley Kellow, *Environmental politics and policy making in Australia*, MacMillan, South Melbourne, 1995.

25 See L Sorenson, 'Rural policy and direct local participatory democracy: inclusiveness, collective agency, and locally based policy', *Rural Sociology*, vol

1998 Murray-Darling cap on water diversions to 1993/94 levels

2001 Independent report on environmental aspects of COAG[26]
- patchy, slow and sometimes absent
- poorly developed tools for ecological outcomes, underfunded programs

2002 greater need for consistency identified by Deputy Prime Minister
- national standardised system for water property rights[27]
- compensation to growers losing water allocations[28]
- national water policy on salinity issues[29]

ABORIGINAL HISTORY OF WATER USE PRE-1788

There are few reports on Aboriginal water use before 1788 and generally a poor understanding of it.[30] The few pieces of information refer to fish traps and these show that there were complex and extensive eel and fish traps in inland Victoria and in the marine environment. This process has been described as eel farming by many authors.[31]

Reports in the 1840s describe gatherings of several hundred Aborigines at such sites and these were highly significant events.[32] The lacuna in knowledge of Aboriginal use of water has been partially filled by a recent ATSIC report.[33]

66, no 1, 2001, pp 1–21. This article describes the capture of local watershed groups in the US by vested interests.

26 Jones Whittington, J McKay, A Arthington, I Lawrence, S Cartwright and P Cullen, *Independent assessment of jurisdictional reports on the achievements of the COAG Water Reforms 2001,* Cooperative Research Centre for Freshwater Ecology, funded by NHT, Environment Australia and National Competition Council, Canberra, 2001.

27 J Koutsoukis, 'National scheme for water rights', *Australian Financial Review,* 7 March 2001, p 7, reporting on the Deputy Prime Minister's proposed speech to the Australian Bureau of Agricultural Economics Conference. NSW was reported by Anderson to have a fragmented system for water allocation which prevented property owners from trading their property rights and making the best use of farm assets

28 J Koutsoukis, 'Water comes to the boil', *Australian Financial Review*, 8 March 2001, p 7, reporting a speech by Deputy Prime Minister John Anderson to the Australian Bureau of Agricultural Economics Conference.

29 In the COAG meeting in April 2002 the states of SA, NSW, Victoria and Queensland supported a National Action Plan on Salinity: *Australian Financial Review*, 4 April 2002, p 4.

30 David Ingle Smith, *Water in Australia*, Melbourne: Oxford University Press, 1998.

31 See JM Powell, *Watering the garden state: water, land and community in Victoria, 1834–1988*, Allen & Unwin, Sydney, 1989, p 22.

32 Ibid, p 138.

What is certain is that Aborigines had an affinity with water. Remnant aspects of their languages and stories reflect that. Stories also exist of the supposedly culturally advanced settlers dying of thirst in areas that supported large mobs. In the Nullabor, for example, there was a network of well-known water holes that were covered by rocks to reduce evaporation. Aboriginal people were often captured by settlers to locate water holes[34] and water was often a site for conflict. 'As a result the blacks were frequently driven away from river frontages and lagoons. They were shot at or ridden down and stock whipped.'[35]

It seems from the limited information available that in some parts of Victoria the boundaries between different mobs were defined by water features[36] and the people would speak of their country in terms of its water. It was typical of the older generation to describe their country in terms of rivers, creeks and water holes. There was also a tradition of sharing freshwater locales. In short water was a source of both subsistence and cultural inspiration.[37]

Some recent anthropological evidence suggests that territories of the groups were shared and managed. The territories were not simply the length of river systems but wedges of different ecological resource locales, including specific stretches of river systems combined in a patchwork effect. Such a land-owning pattern assisted in the exploitation and management of basic necessary resources for the sustenance of the regional land-using and land-owning groups. The access of these groups to resources outside of their locale was achieved by various kinds of social intercourse and exchange with their neighbours, including marriages.

EARLY EXPLORATION IN SOUTH AUSTRALIA

The early settlers regarded Australia as terra nullius, that is a land ungoverned, and believed that Aboriginal clans had no proprietary interests. This doctrine subsisted until 1992 when the *Mabo* case[38] overturned the assumption that indigenous Australians did not have law. So at the time of settlement of South Australia, the view was that the common law of England applied where it was relevant to the colony.

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33 Langdon, *Briefing papers: Indigenous rights to waters*.

34 Australia, Race Discrimination Commissioner, *Water: a report on the provision of water and sanitation in remote Aboriginal and Torres Strait Islander communities*, Federal Race Discrimination Commissioner, Canberra, 1994.

35 Ibid.

36 JM Powell, *Watering the garden state*. There is a map on p 24 that shows borders of conjectured Aboriginal territories in relation to major drainage divisions which reflects a remarkable coincidence of real or apparent jurisdictions over primary water resources.

37 Langdon, *Briefing papers*, p 51.

38 *Mabo v Queensland (No 2)* (1992) 175 CLR 1.

South Australia was unique in Australian settlement history in that it was planned in England. Other parts of Australia muddled through but South Australians zealously attached themselves to a conscious theoretical purpose.[39] South Australia was rationalised in plan before it was discovered on land.[40] It was a huge misperception in the making. Indeed it has been described as the ideal test for utilitarian views on colonisation.[41] Conway suggests that the utilitarian concept of the greatest good for the greatest number can be expressed as: material wealth=pleasure=happiness=reason for living. Conway states that this was entrenched in our system up to the 1970s in our legal codes, public service industries and public services. This assumes that broader environmental or other social justice ideals do not matter as 'long as the yams and the coconuts are plentiful. Meanwhile the great arid, polluted continent we have exploited and violated stares back, sightless and incredulous at our naivety of spirit.'[42]

Water was the component that had to be exploited to drive this utilitarian ideal. Indeed South Australia was the site chosen to put into practice the dreams of the National Colonization Society which had among its members such luminaries as Jeremy Bentham and John S Mill.[43] This noble ideal was fostered by imperfect information about a great river debouching near Gulf St Vincent.

The principles of the Wakefield scheme were:

1 Land should be sold at a fixed minimum price or above.

2 The proceeds of land sales should be used primarily to subsidise the emigration of bona fide colonists.

3 The volume and pace of emigration should be closely monitored and correlated to the amount of land available.

4 Settlement should expand in contiguous blocks (the principle of concentration).

5 There should be a large measure of local self-government in matters of selection of officials, land sales, emigration and revenue.

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39 Douglas Pike, *Paradise of dissent: South Australia 1829–1857*, Longmans, London, 1957, quoted in DW Meinig, *On the margins of the good earth: the South Australian wheat frontier, 1869–1884*, Rigby, Adelaide, 1962, p 8.

40 Meinig, ibid, p 8.

41 Ronald Conway, *The great Australian stupor: an interpretation of the Australian way of life*, Sun Books, Melbourne, 1971.

42 Conway, *The great Australian stupor,* p 68.

43 Ibid.

Wakefield in his first paper in 1830 wrote 'What is known about the climate, the soil's capacity of production and the local situation of Gulf St Vincent is of a most flattering nature.'[44] Actually precious little was yet known about such matters but the idea of a colony in southern Australia was firmly established from this date. Four years later an Act of the British Parliament to establish a province of South Australia was passed. Bentham's suggested name, 'Felicitania', was not accepted but the exuberant idealism it symbolised flourished unabated under the more prosaic name South Australia.[45] In these four years more information about the land had been obtained and the explorer Sturt had been consulted. His evaluations were favourable and suggested the east coast of Gulf St Vincent as the best site for a capital. By 1836 some more information had been gained about the climate and soils but still a misperception existed.

In the first few years after settlement a Mediterranean climate had been inferred for the area. The mild, wet winters and hot, dry summers had been likened to the seasons of southern Europe, prompting the promoters of the colony to envisage the production of characteristic crops such as citrus, olives and wine grapes. However initial impressions of Eyre and Yorke peninsulas and the common scarcity of surface waters immediately raised concerns over the generally arid appearances. That this dryness intensified northward was obvious in any season. The English migrants soon stopped sighing for the summer sun and yearned for the first winter rains.[46] This was a warning that, no matter how carefully and thoroughly settlement was designed, one could not really make a little England out of such land.

The relative scarcity of reliable streams was yet another strikingly different feature of the new homeland. Only the Mt Lofty ranges support a fairly dense succession of perennial streams; but they are short, small and even the more lengthy from the Torrens to the Wakefield ooze sluggishly across the lower plains with hardly sufficient volume or velocity to reach the sea. The central hill country is drained by the River Broughton, which has a more extensive basin than any to the south, but with so little water that through much of the year many of its tributaries are little more than a tracing of gullies shallowly incised into the red earth. Farther north the Flinders arc trends so near the coast that its westward drainage is but a series of small creeks.[47]

1836 COLONIAL GOVERNMENT EXPLOITATION OF WATER

The settlement of SA expanded using railroads. In 1860 the railroad reached Kapunda, then a copper centre and the colony's largest wheat receiving station. Some expansion of colonisation was already underway in the plains to the west. A

44 Wakefield, first paper of December 1830.
45 Meinig, *On the margins of the good earth,* p 11.
46 Pike, *Paradise of dissent,* p 498.
47 Meinig, *On the margins of the good earth,* pp 20–23.

special modification of land laws in 1867 had allowed long-term leases on selected areas of mallee country but clearing the scrub was a laborious and costly process. The colonisation process expanded north of Clare by 1869 as the *Strangways Act* 1869 created agricultural areas under the Wakefield plan. In March of 1869 the *Northern Argus* reported that the land north of Clare was not known. But by mid-winter many farmers were inspecting the land. Soon over 200 acres were broken out for cultivation. The selection of lands designated to be surveyed was in the hands of Goyder the Surveyor-General. The legislation specifically stated that if *most* of each area was suitable for agriculture then they could be selected on credit. However, Goyder's reconnaissances during the great drought of 1864 were still fresh in his mind and he had serious doubts about fostering the expansion of agriculture northwards. He could not block the intent of parliament, but he could and did sound a warning. For example when he established Belalie Agricultural Area in September 1870 he described its potential with characteristic caution:

> The soil is generally good agricultural land, the ranges only being rough and stony; the whole is excellently grassed. Permanent water exists in several places, but great risks will be run by agriculturalists from hot winds, which are frequent and cannot but have a destructive effect upon crops from October to December.[48]

But his opinion was no deterrent. Good grass, soil and water could be seen, hot winds remained to be experienced, and there was a quick scramble for the best farms. Over 5000 acres were selected in two months with from 2 to 11 simultaneous applications for each block.

The crops of 1871–72 were a severe disappointment throughout the colony. Yields of three to five bushels were reported.

> It was evident to all thinking people that the North is not so thoroughly adapted to wheat growing as to guarantee a steady and reliable source of livelihood to farmers. Good crops for two years is seldom dreamt of, whilst consecutive seasons of bad crops are generally anticipated.[49]

The writer went on the stress the need for better cultivation and diversification: flax or olives seemed most feasible. But such doubts or admonitions did little to stem the demand for land. Disgruntled farmers complained not of their land but of the government and its cumbersome policies. The feeling seemed to be that if only the crippling restrictions on areas, acreage and credit were removed all would be well. A poor year now and then was to be expected during this pioneer stage, but as

48 AW Goyder, SA Parl Paper No 89, 1870–71.

49 *Northern Argus*, Clare, 19 April 1872, quoted in Meinig, *On the margins of the good earth,* p 40.

cultivation progressed the seasons would improve. One of the great myths and misperceptions was 'rain follows the plough'.

The *Strangways Act* 1869 had been mired in criticism from the beginning but Goyder upheld the SA policy of restricted credit selection. He saw three serious dangers in throwing open all lands.

1 It would allow the eyes of the country to be picked out and thereby enrich a few individuals at the expense of the entire community and reduce the value of adjacent lands.

2 It would offer a premium to the exhaustion of the soil by giving new or virgin soil in exchange for worked out land.

3 It would sacrifice the benefits of closer settlement and induce a scattering which would have serious social consequences especially in the lack of schools and churches.

The government yielded to the pressure from farmers in 1872. It did away with the concept of Agricultural Areas and allowed all of the farm blocks to be purchased on credit. A line was to be drawn across the northern country separating pastoral leases from the new farming domain. Goyder's line was not an arbitrary choice; rather it was based on a division in rainfall. Its origins go back to 1865 when Goyder was instructed to mark a line between that portion of the country where rainfall had extended and that where drought prevailed.[50] This line extended considerably further south than he expected. When Goyder was asked whether this line separated land suitable for agriculture and that for only pastoral use he replied:

> It does to a certain extent; but there is some portion of the country where, although the soil is eminently adapted for tillage, and will grow anything, the particular position of it and its openness to hot winds render it such as can only safely be continued as pastoral land.[51]

In 1872 there was enough land south of the line to not make it a controversial issue. The definition of aridity was at the time held to be less than 10 inches of rain in the year. However in these areas it was the manner of the rain falling that was critical. Five inches of deep rain at the right time is better than 10 inches spread over the year.

50 SA, Parl Paper No 62, 1865–66.
51 Ibid.

The arid pastoral belt indeed occupied nine tenths of South Australia. The present landscape of this region shows many deserted houses: 'the victory of nature over man's defeated optimism', as it was described by Radcliffe in 1938.[52]

Aridity and hot winds were punctuated in this area and all over Australia by times of massive floods. So much so that water and land use planning has come to mimic a hydro-illogical cycle (see figure 3) with planning reflecting the cycle and then lasting until the next crisis. The following poem describes the situation of the cycle of droughts and floods. It was written about western NSW.

Said Hanrahan
PJ Hartigan (John O'Brien)

We'll all be rooned said Hanrahan, in accents most forlorn
Outside the church ere Mass began
One frosty Sunday morn.

If rain don't come this month said Dan
And cleared his throut to speak
We'll all be rooned said Hanrahan
If rain don't come this week…

In God's good time down came the rain,
And all the afternoon
On iron roof and window pane
It drummed a homely tune…

And every creek a banker ran
And the dams filled overtop;
We'll all be rooned said Hanrahan
If this rain doesn't stop.

IRRIGATION IN SA

The vagaries of pastoral lands and the realisation that there was no inland delta led to the development of irrigation. This was a job assigned to a mega-public service body called the Engineering and Water Supply Department.

In the late nineteenth century irrigation settlements on the River Murray were established along westward-flowing reaches between the SA and NSW border and Morgan. The Chaffey brothers, who had founded successful schemes in California, were provided with 12 000 ha of floodplain land which was subdivided into 4 ha

52 Francis Radcliffe, *Flying fox and drifting sand: the adventures of a biologist in Australia*, Chatto and Windus, London, 1938, p 192.

blocks. These enterprises were often called fruit salad blocks and were intended to resettle soldiers from both world wars and to encourage British immigrants to relieve the overcrowding there and increase primary production in Australia. The whole land division was laid out using English concepts of counties and using English perceptions of size. The aim was to encourage small homesteads with a variety of crops, in part to avoid the 'farming lord'. Each yeoman farmer could produce enough 'through the spade, fork, pick axe and the long punch and this would make any country great'.[53] This has been called colonial socialism by some authors. The enterprise collapsed in 1893 due to uncertain river flows and salinity and was later taken over by the Renmark Irrigation Trust. The scheme was constructed using open channels which leaked and also suffered huge evaporation losses.

The irrigation schemes in SA and Victoria were built on a foundation laid by Deakin, who was commissioned in 1880 to write a report on irrigation relying on US information.[54] The report contained these recommendations:

- the state should have supreme control and ownership of water;
- the state should dispose of the water to irrigators to maximise use and economic value (in the small blocks described above);
- a local water master should be set up to supervise distribution and settle disputes;
- the state should provide information on the suitability of the land for irrigation; and
- each irrigation authority should have a formal organisation to prevent the rise of monopolies.

In the early 1920s citrus growers further complained about the increasing salinity of the water and the damage caused to their fruit blocks. The Engineer-in-Chief's Department built the South Eastern Drainage Scheme but complaints about the administration of it in 1924 meant that a separate authority was set up. Locks were built on the Murray in 1927 to universal acclaim.[55]

During the 1940s barrages were built to keep the lower Murray River and the terminal lakes fresh. The construction of the barrages allowed the establishment of extensive irrigation near the lakes. Later another avenue for irrigation was to reclaim swamps. From 1957 comprehensive drainage schemes were established to contain rising groundwater tables and evaporation basins were established to dispose of drainage water.

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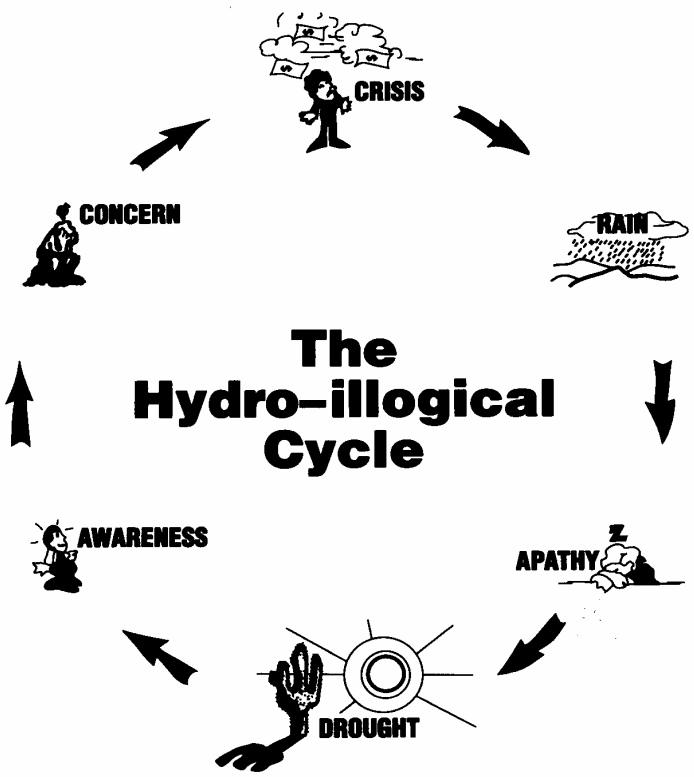
53 See Victoria, *Agricultural and Horticultural Gazette,* 1857, cited in Powell, *Watering the garden state*, p 40.

54 See Smith , *Water in Australia*, p 152.

55 M Hammerton, *Water South Australia: History of the Engineering and Water Supply Department*, Wakefield Press, Adelaide, 1986.

The drought of 1967–68 exacerbated the salt load problems, and the SA government declared a moratorium on irrigation development along the river. Thus the hydro-illogical cycle of management prevailed.

Figure 3[56]



AUSTRALIAN WATER LAW: SECTION 100 OF THE CONSTITUTION

The federation of Australia in 1901 was a contested issue, and the eventual political compromises resulted in the power over water remaining with the states. The powers of the new federal government were listed in section 51 and these are broad, with 39 placita coving such topics as trade and commerce. These powers are to be construed liberally.[57]

56 Source: Smith, *Water in Australia*.

57 James Crawford, 'The constitution and the environment', *Sydney Law Review*, vol 13, 1991, pp 13–15.

It was because of the wide powers in section 51 that a prohibition over Commonwealth power was inserted to protect the rights of the residents of the states to the reasonable use of rivers for conservation or irrigation.

> Section 100: The Commonwealth shall not, by any law or regulation of trade or commerce, abridge the right of a State or of the residents therein to the reasonable use of the waters of rivers for conservation or irrigation.

Section 100 was inserted because NSW, Victoria and South Australia feared Commonwealth laws under section 51 might affect their common interest in water for irrigation.[58] Section 100 arose out of the twofold importance of rivers for navigation and of reservoirs for storage for irrigation. The object of the section is to limit the paramountcy of the Commonwealth's power to make laws with respect to navigation so far as it would limit the reasonable use by the states of water conserved in dams for irrigation.[59] The river systems in Australia bore close resemblance to the western United States, and US cases were undeniably important in setting the framework of this section and the whole constitution.

> The paramount interest is not in the navigation of the rivers but the cultivation of the soil by means of irrigation … ample facilities for transport of goods are furnished by railroads not by rivers. … But on the other hand the use of waters of all of the streams for irrigation is a matter of the highest necessity to the people inhabiting this region, and if it were denied to them, it would injuriously affect their business and prosperity to an extent that would be an immeasurable public calamity.[60]

The Federation was grafted onto and over existing colonial legislatures who had evolved unique Acts and unique institutions from a complex history of partisan political negotiations.[61] Each state has an introspective approach to managing water[62] and New South Wales acted as though the Murray belonged to it alone.[63] It

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58 PH Lane, *Lane's Commentary on the Australian Constitution*, Law Book Co, North Ryde, NSW, 1986, p 853.

59 John Quick and Robert Randolf Garran, *Annotated Constitution of the Commonwealth of Australia*, Angus and Robertson, Sydney,1976, p 880.

60 *United States v Rio Grande Dam and Irrigation co New Mexico* 51 Pac Rep 674 (1899).

61 Peter Hallows and Donald Thompson, *The history of irrigation in Australia*, Australian National Committee on Irrigation and Drainage, Canberra, 1999.

62 JM McKay, 'Water planning in SA', *Australasian Journal of Natural Resources Law and Policy,* vol 1, no 2, 1994, pp 595–609.

63 W Broughton (ed), *A century of water resources development in Australia, 1900–1999*, The Institution of Engineers Australia, Sydney, 1999, p 205.

took until 1915 to draw up an agreement over the River Murray between three states and until 1992 to add Queensland.

NATIONAL INTERVENTION THROUGH SECTION 96

Despite section 100 the Commonwealth has intervened in state water management, for example through section 96, which allows the Commonwealth to impose conditions on financial assistance to the states. Salinity issues were noted in the national arena in 1970 by the Senate Select Committee on Water Pollution, which suggested that salinity on the River Murray was one of our biggest water problems. In 1978 this was reflected in the *National Water Resources Financial Assistance Act,* which funded a broader range of works, aiming to conserve water, manage water quality, and mitigate salinity and floods.

In 1992 the Commonwealth created an integrated approach to management of land, water, soil and vegetation. The SA entitlement flow is the minimum monthly flow under all but the most extreme conditions and is 1850Gl per annum. Each state created water authorities, and there were 800 in 1990. These bodies were constructionist in nature. For example 44 per cent of Australia's large dam capacity was built between 1970 and 1980.[64] None of these dams were built in South Australia, but the constructionist mentality was alive in the channelling of rivers and the drainage schemes.

SOUTH AUSTRALIAN WATER LAW

South Australia developed its own water laws, which vested water in the Crown and then generally allocated it by crop area to farmers. Water was seen as a common property that could not be owned by an individual in its natural state, but the state could grant a right to use it. In SA, the most extensive rights existed over a prescribed watercourse, which could often be one section of a large watercourse. This is even tougher today in that a licence is required that must be issued in accordance with a water allocation plan. Where the resource is not prescribed, water allocation plans *may* exist.

There has been legal uncertainty about the abolition of riparian rights (the rights of those who own the riverbanks) but South Australia created a stock and domestic allocation in lieu of this.[65] Until recently South Australia allowed an unfettered right to collect water falling on land although this has changed recently. In SA in the Mt Lofty Ranges capture of runoff water in farm dams is limited to 50 per cent of the estimated runoff for each property.[66]

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64 Ibid, p ii.

65 This amounts to 500 kl per annum on the Murray at present.

66 SA Water, *Water pricing in SA: a discussion paper*, SA Water, Adelaide, 1999, p 12.

NATIONAL ENVIRONMENTAL AWARENESS

In the 1970s a plan to dam a Tasmanian river and destroy a natural lake captured the attention of the Australian public and resulted in environmental issues challenging the dominion theory to some extent.

The words of Olegas Truchanus are instructive.

> In 1971 Tasmania is not the only place in the world where long-term careful argument has been defeated by short-term economic advantage. When we look around, the time is rapidly approaching when natural environment, natural unspoiled areas are leftovers from a vanishing world. If we can revise our attitude toward the land under our feet and accept the role of steward and depart from the role of dominator, if we can accept the view that man and nature are inseparable parts of the unified whole, then Tasmania can be a shining beacon in a dull, uniform and largely artificial world.[67]

The campaign to save this lake did not succeed. However, it set the scene for later debates. The pioneering words of this early conservationist are now relevant once more in the stage of complex issues in water development (see figure 1).

> It is no good having idealistic solutions that will just not work. It is no use proposing to governments things governments just cannot do. We have to think of practical things and you may take it for granted that it is very often difficult to find and put forward that worthwhile solution—a solution that is practical and one which we could work and press for. We need innovation, and innovation is seldom a strength of government.[68]

Long-term planning is also not a strength of present governments.

EXOGENOUS EVENTS WITH IMPLICATIONS FOR WATER MANAGEMENT

In 1992 the *Mabo* case overturned the doctrine of terra nullius on land and opened the way for native title claims over land and fresh water. This means that native title rights exist as part of the law of Australia and the question now is when these rights can co-exist with other rights over land and water. In 1993 the Commonwealth *Native Title Act* allowed freshwater claims.

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67 Max Angus, *The world of Olegas Truchanas*, ACF, Hobart, 1971, p 51.
68 Ibid, p 53.

In 1994, the Bureau of Meteorology revised the estimates for probable maximum precipitation.[69] This is defined by the World Meteorological Organization as the greatest depth of precipitation for a given duration meteorologically possible for a given size storm area at a particular location at a particular time of the year. The revision had a dramatic effect on the risk associated with spillway failure in large and small dams. The new figures suggested an unacceptable risk and so much money was spent upgrading dams such as Kangaroo Creek.[70] The impact of this reassessment of the risk of extreme events is also relevant to farm dams, which impound up to 9 per cent of Australian water.[71] Recently some states, notably Victoria, NSW and Queensland, have addressed this issue in their new water laws to proscribe spillway assessments and maintenance.

1994–95 COUNCIL OF AUSTRALIAN GOVERNMENTS WATER REFORMS

Governments in Australia started creating a vision for national competition reform in October 1992. In April 1995, the Council of Australian Governments agreed to a package of reform arising from the Hilmer Report but also from the previous commitments to electricity, gas, water and road transport. The agreement to implement the reforms has been split into three tranches with a total of $16 billion being paid over the period to 2005–06.

The reforms were driven by graphic reminders of the effects of inappropriate and inefficient water use such as:

- rising water tables
- increased salinity of groundwater and soil
- decreasing surface water quality
- algal blooms, and
- degradation of coastal areas.[72]

The impacts of salinity are widespread,[73] including loss of agricultural production (estimated to be $137 annually), loss of capital value of land ($700 million), and

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69 Bureau of Meteorology, *The estimation of probable maximum precipitation in Australia: generalised shor- duration method*, AGPS, Canberra, 1994.

70 See JD Pisaniello and J McKay, 'Models of appropriate practice in private dam safety assurance', *Water Policy*, vol 1, 1998, pp 525–550.

71 See *Australian water resources assessment 2000: surface water and groundwater availability*, National Land and Water Resources Audit, Natural Heritage Trust, 2001.

72 See discussion in J McKay, 'Marketisation in Australian freshwater and fisheries management regimes: progress and issues models in urban and rural water progress and issues up to 2000' in S Dovers and S Wild Rivers (eds), *Processes and institutions for resources and environmental management: Australian experiences: report to Land and Water Australia*, in press, 2002, chapter 15.

increased salinity of streams. The impacts on native vegetation and wildlife are profound: according to some estimates half of Australia's water birds have disappeared. Salinity also damages roads and bridges and the impact on urban households includes structural damage to houses. At present about 2.5 million acres or 4.5 per cent of cultivated land is affected by salinity and up to 15 million acres could be affected. One solution to this is to minimise deep drainage beyond the root zone.[74]

Other water-related issues of agricultural practices are nutrient loading, erosion control and management, and application of fertilisers to minimise run-off and hence nutrient loading.

The Council of Australian Governments reforms aimed to promote institutional reform, that is the adoption of

- an integrated water catchment approach;
- separating the roles of water resource management, standard setting and regulatory enforcement;
- incorporation of water markets;
- full cost recovery; and
- further development of inter-agency comparisons, that is benchmarking.

These reforms are still beset by the problems of muddling through and legal pluralism, as mentioned above. However, because of the corporatisation of former government business enterprises, the reforms do open the door for more Commonwealth regulation of water corporations. It would now be possible to pass national regulations on such issues as water quality.[75]

THE NEW ACTS

The new Acts require the relevant minister and all those administering the Acts, such as water management committees, to have regard to the economic, environmental and social impacts of water decisions. Obscure, hard-to-picture

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73 See Science, Engineering and Innovation Council, *Dryland salinity and its impact on rural industries and the landscape*, Department of Industry, Science and Resources, 1998; see also E Willett, 'The introduction and implementation of competition reform to the Australian water sector', paper presented at annual New Zealand Water Summit, 1999.

74 See Natural Heritage Trust, *Australian Agricultural Assessment 2002*, Natural Heritage Trust, Canberra, 2002, p 122.

75 A Moeller and JM McKay, 'Is there power in the Australian Constitution to make laws for water quality?' *Environmental and Planning Law Journal*, vol 17, no 4, 2000, pp 294–307 and also 'Is it time for a new model of water quality laws?' *Environmental and Planning Law Journal*, vol 17, no 3, pp 165–175.

objectives such as those found in many new water Acts need to be made clear with guidelines on

- conflict management,
- the veracity of information, whether hydrologic, environmental and economic, and
- procedures for appointment of the water management plan representatives to avoid pork barrelling.

Each state has passed a new Act as a response to the need to reform the water sector. Each Act is introspective, with only the Queensland Act looking beyond its borders to state that the aim of the Act is to manage water for the benefit of the people of Australia. Only two Acts mention Indigenous rights to water; these are the Queensland and NSW Acts.

In SA, our Act was one of the first as it was able to build on much state-level attention to water issues. SA Water is the dominant supplier of water for urban purposes and rural stock and domestic uses. In 1996 it outsourced the operation, maintenance and management of water systems to United Water for a period of fifteen and a half years. SA Water also contracted out on a build-own-operate basis the building of ten regional water treatment plants to Riverland Water. SA Water remains the water service provider, with responsibility to the customers across the state, and retains ownership of the assets.

The powers of the minister set out in section 45 of the *Water Resources Act* (SA) are to review the condition of water resources, develop water management policies, allocate water and promote public awareness of the importance of water resources. The minister appoints committees and approves plans created by catchment water boards in prescribed resources and has power over non-prescribed resources. The catchment water plans and the water allocation plans are not linked.[76] In all of these actions the Minister is obliged to fulfil the tripartate considerations to be ecologically, environmentally and socially sustainable. The overall object of the minister is to ensure

> the physical, economic and social well being of the State and facilitate the economic development of the State while protecting the entitlements of future generations and ecosystems dependent on those resources.[77]

Key issues for South Australia are water trading and environmental flows in the rural sector, and demand management and water recycling in the urban sector.

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76 J Botton, Water Law Seminar, Law Society of SA, Adelaide, June 2001.

77 *Water Resources Act 1997* (SA) s 5.

Water trading

Water trading has been possible in SA since 1983 (the first state to allow it), NSW since 1989 and Victoria since 1991. SA grafted this initiative onto conservative water allocation policies, Victoria on to less conservative policies and NSW into a situation in which water has been grossly over-allocated. In South Australia the existing allocation policies did not require the grower to use the water in order to keep the allocation. In some areas an informal process of sales between neighbours evolved.

The aim of allowing trading in rural water entitlements was to increase the use of water. The result has been to activate huge quantities of sleeper (never used) and dozer (sometimes used) water. This has negative environmental effects.[78] Hence it appears that allocations will need to be reduced and existing irrigators will need to buy water. Many irrigators see this as unfair income redistribution, as they have to buy unused water from their neighbours. The cotton industry is aggrieved by this and calling for compensation.[79]

On the other hand, trade in water has had the positive benefit of moving water away from some areas of poor soil and allowing growers to retire on the farm, thus preserving rural communities. The long-term social justice aspects of this trade are poorly researched. It seems that water is being stockpiled[80] and the Australian Competition and Consumer Commission have launched a research project into this.

Allocation of water for the environment

In SA most water has been sold upstream and this has negative environmental effects as it reduces stream flows in the lower river, thus increasing saline intrusion, and also increasing groundwater salinity levels in the land upstream. The state government has had a policy of requiring irrigation and drainage management plans. However, only 30 per cent of growers use these plans in their ongoing management.[81] This is a clear example of regulatory failure.

In 2001 Environment Australia and the National Heritage Trust commissioned an independent report on the environmental aspects of Council of Australian

78 J McKay and H Bjornlund, 'Market mechanisms as a component of environmental policy that can make choices between sustainability and social justice', *Social Justice Research,* vol 14, no 4, 2001, pp 304–317.

79 *Land and Water News,* September 2001; and Stephen Whyatt and Katharine Murphy, 'Liquid gold', *Australian Financial Review,* 28 August 2001, p 2.

80 Personal communication, various water industry officials.

81 Based on data collected in a Land and Water Australia research project, 'Structural adjustments via water markets'.

Governments[82] reform in all states, especially its implementation. The results showed that implementation:

- was patchy, slow and sometimes absent;
- included poorly developed tools for ecological outcomes, and
- was replete with under-funded programs.

Demand management

Demand management is relevant to the rural sector but is a term generally applied to the urban consumer. Typical urban water use in Australia is between 200Kl and 320 Kl per year per household.[83] According to SA Water Adelaide's annual use per household is 250Kl[84] or 276Kl[85]or five domestic swimming pools.[86] Estimates of unaccounted water range from 6 per cent to 40 per cent for the utilities responsible for the reticulation. The sources of water for urban utilities are 83 per cent surface water and 15.4 per cent groundwater with less than 1 per cent desalination. Only five utilities reported some use of recycled water for non-potable purposes. Some water is recycled in South Australia but that is then applied to irrigation in the Virginia pipeline area and Willunga.

At present water prices do not reflect the real costs of water consumption, that is the environmental costs of diversions. The price of drinkable water will rise in the future to reflect the environmental costs. The ways to reduce demand are well established such as dual flush toilets (pioneered here), water-efficient showerheads, planting local plant varieties and not over-watering.[87] There is no one body coordinating this[88] in SA or Victoria.[89] There needs to be a simple industry standard for the building industry to guide the installation of water reuse systems. At present individuals who install these need multiple approvals and the cost is several thousand dollars.[90] The ideal would be for a customer to be able to go to a plumbing supplier and be able to convert their bathroom for grey water recycling.

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82 Whittington et al, *Independent assessment of jurisdictional reports on the achievements of the COAG water reforms 2001*.

83 Australian Water Association, *Australian non-major urban water utilities*, Performance monitoring report, AWA, Sydney, 2000, p 16.

84 SA Water, *Water pricing in SA*, p 4.

85 SA Water, *2001 Annual Report*, SA Water, Adelaide, p 2.

86 'Kicking the H2O Habit Money Managers', *The Age*, 4 March 2002, p 5.

87 See SA Water, *Gardening guide* brochure, Adelaide, no date.

88 J McKay, 'Ensuring corporate social responsibility in the management of the water sector by improving governance structures: lesson from international corporate law', abstract for Stockholm Water Symposium, 2002.

89 Bartley, *The Age*, 4 March 2002, p 5 (on Victoria).

90 Ibid.

FUTURE OF WATER RESOURCES DEVELOPMENT IN SOUTH AUSTRALIA

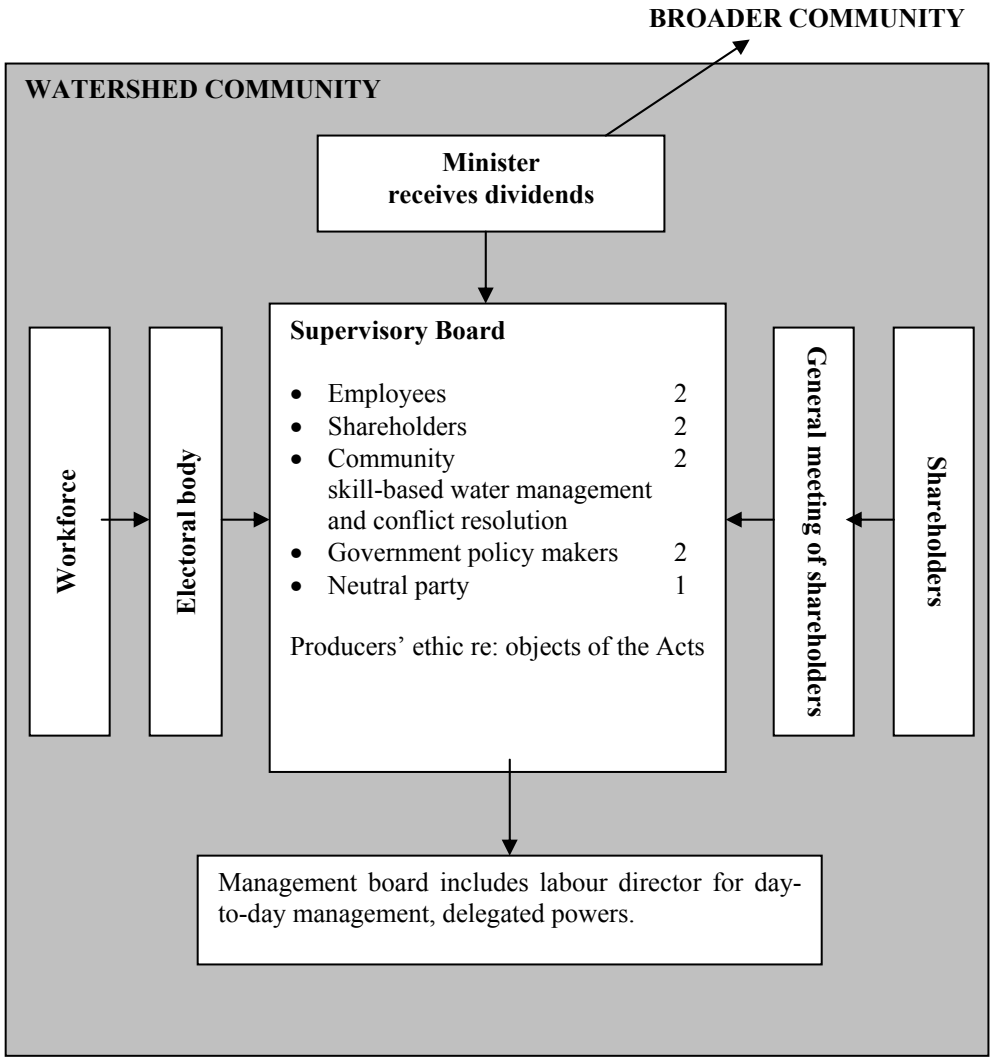
The difficulty is in finding a way to implement sustainable water developments that reflect short and long-term goals in a complex regime (see figure 1). The regimes chosen will need to be flexible but innovative. In the six years since the reforms some progress has been made but it will be the next decade when regimes and procedures are tested.

The need is to increase the formality, inclusivity and breadth of the regulation model to remove short-term planning regimes (such as the hydrological cycle) and to increase the power of the regulators. The institutional arrangement presented in figure 4, with shareholders and other stakeholders incorporated into decision making at the highest levels, may well be able to achieve the aims of the *Water Resources Act*. At present the water allocation plans are made by a broad group including all stakeholders but unless those groups are monitored and provided with adequate information on the hydrology, economics, and social and environmental impacts of decisions then this type of local democracy may well be captured to preserve the status quo.[91] The problems include cynical manipulation of results to give political legitimacy to decisions, and lack of inclusiveness in issues and groups represented. The way around this would be to provide procedures for conflict resolution at this level, and procedures to provide and train persons to appreciate the hydrological, economic, environmental and sociological issues.

So, in addition to the incorporation of stakeholder interests at the plan level, it is important to have broader representation at the higher level. This diagram illustrates how such a body could be created.

91 L Swanson, 'Rural policy and direct local participatory democracy: inclusiveness, collective agency and locality-based policy', *Rural Sociology*, vol 66, no 1, 2001, pp 1–21.

Figure 4: Government business enterprises as green enterprises[92]



ELEMENTS OF A WATER FUTURE FOR AUSTRALIA

South Australia is part of the hydrological and physical environment and relies on water from interstate in the Murray to supply much of its needs. This is but one

92 Adapted from ACTU, *Australia reconstructed*, ACTU, Canberra, 1987; and M Janicke and H Weidner (eds), *National environmental policy: a comparative study of capacity building*, Springer Verlag, USA, 1997. Special mention to Tony Short.

small illustration of the need to have a national water policy. This has been suggested at some times in the past, notably in relation to pollution of streams in 1923,[93] despite section 100. There is also adequate power in section 96 to regulate many aspects of water resources.

Recently, in relation to the issue of salinity, the proposal has been mooted to be 'under the personal direction of the Prime Minister to avoid bickering between the states and promote rational use of water'.[94] The structure and powers of any federal government body will be crucial. Some consider it may be better to have an independent board.

The literature recognises two models for implementing integrated river management: the authority model and the coordinating model.[95] The Murray Darling Basin Commission is an example of the coordinating model and has the weakness of that model, namely that agreements are voluntary. The authority model in other countries has weaknesses that can be overcome in Australia. A third model is possible that relies on unique elements in the Australian Constitution. That would be a partnership model but with the proviso that the national government set the objectives. These should include:

- rationalisation of the different property rights to water, and water allocation policies;
- compensation for loss of rights;
- achievement of uniform water quality standards and procedures to deal with local issues to eliminate the unfairness inherent in different water qualities;
- implementation of water recycling schemes in urban developments and water-sensitive designs generally;
- implementation of demand management measures in all new green field developments and in substantial renovations;
- a national agricultural policy based on land assessment;
- water utilities having similar management structures (see figure 4)
- application of best practice technologies such as water desalination;[96] and
- standard environmental reporting criteria on water use and environmental flows.

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93 Commonwealth of Australia, *The pollution of streams and other natural waters in Australia*, Issued by the Division of Sanitary Engineering, Commonwealth Department of Health, Government Printer, Melbourne, 1923.

94 *The Age*, 30 Jan 2002. The proposal has been tied up with one to divert flows of the Clarence River in NSW into the Darling and commentators have wondered about this given that existing farming practices have contributed to salinity.

95 See International Food Policy Research Institute, *A 2020 vision for food, agriculture and the environment*, Svenson Focus Paper 9, 2000.

96 Ben Ruse and Carmelo Amalfi, 'State looks at desalination plant', *The West Australian*, 16 November 2001, p 11.

If this were applied in one region at first, the present organisational structure of the Murray Darling Commission would need to be modified to refer powers over water allocation to a central body, not leave it with the states. This power to refer powers has been well used in Australian constitutional history.

The corporatised water providers in the urban areas have adopted a wide array of forms, usually governed by a state-owned corporations Act. Figure 4 suggests a better model, which should also be imposed by the national government.

Let us start with imagining the future. As Frank Moorhouse had the Inspector-General of Misconception say, 'The single most damaging vice in the conversation of Australian intelligentsia is the left–right categorisation as the way of dismissing a policy proposal.'[97] For the management of water in Australia we need a new paradigm, new institutions and a much more inclusive approach. We need single-purpose water agencies, the separation of water agencies from related government bodies, separate agencies for conservation, and environmental management that recognises the connection between social and economic planning. We have an overwhelming need to reconcile inter-agency conflicts, drinking water versus irrigation and the need to reconcile competing mandates, such as recreation versus water supply.

No longer can we overlook the place of water in environmental sustainability, social and economic development. The UN has drafted a treaty called the Treaty on the Non-navigational use of International Watercourses.[98] This treaty was ready for ratification in May 2000. The principles established by the treaty are

- equitable and reasonable utilisation;
- an obligation not to cause significant harm;
- prior notification, and cooperation on the basis of sovereign equality and mutual benefit.

In the world water sector cooperation has prevailed over conflict in acute water resource areas.[99] The most vehement enemies all over the world have negotiated water sharing agreements. Such treaties have taken time to negotiate: 10 years for

97 Frank Moorhouse, *The Inspector-General of Misconception: the ultimate compendium to sorting things out*, Vintage, Sydney, 2002, p 260.

98 This treaty has not been ratified yet. It was drafted in 2000 but failed to get 35 country endorsements. The ratification process remains open-ended and it has served as the model for the Mekong River Agreement. Sweden, Ministry for Foreign Affairs, *Transboundary water management as an international public good: executive summary*, Department of International Development, Ministry for Foreign Affairs, Sweden, 2001.

99 Sandra L Postel and Aaron T Wolf, 'Dehydrating conflict', Foreign Policy Magazine, September–October 2001.

the Indus, 30 years for the Ganges, and 40 years for the Jordon. In Australia we can sadly say that we have not yet negotiated such an agreement.

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