

Farm, food and resource issues: politics and dryland salinity

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Abstract. Political forces make it difficult to develop effective and efficient policies for dryland salinity. The politics of the day have had major influences on salinity and salinity-related policy, beginning with the clearing of land for agricultural development. Tensions affecting salinity policy include urban political power v. rural salinity; short-term politics v. long-term salinity; crisis-driven politics v. slow and inexorable salinity; simplistic and uniform political solutions v. complex and diverse salinity problems; the need for winners in politics v. the reality of losers from effective salinity policy; east v. west; and national v. state governments. These tensions will interact with our improving scientific knowledge of salinity and ongoing social and economic changes in rural areas to shape future salinity policies. Prospects for changes in salinity policy and outcomes over the next 10 years are suggested, including the following possibilities: more carefully targeted and site-specific investments in salinity prevention; the beginnings of success of current research and development efforts to develop profitable new plant-based systems for salinity management; ongoing debate about the appropriate role for catchment management bodies for in salinity management; greater attention to the problem of salinity impacts on biodiversity and infrastructure; reduced attention to market-based instruments for salinity; and ongoing changes in the economics of agriculture, timber and energy influencing salinity outcomes and, potentially, salinity policy.

Additional keywords: economics, environmental management, government, natural resource management, policy.

Introduction

Ingredients of politics in a democracy include the values and attitudes of the voting community, the quest for power and survival by politicians and their parties, the ideologies and values of those political parties, the media as communicator and watchdog, the pursuit of resources, influence and effectiveness by the public service and the attempts of special interest groups to have their interests met. Among the players there is a mixture of people seeking advantage for themselves or some group, and people seeking to do ‘the right thing’ for the whole community. The outcome and the instrument of politics is government policy.

In the case of dryland salinity, the stew of government policies that has been cooked up from these and other ingredients has not proved to be a sustaining diet for those with an appetite for efficient and effective outcomes. Government policies contributed in important ways to the development of the salinity problem. For decades, policy makers ignored the developing threat of salinity (e.g. Beresford *et al.* 2001). And then, once the threat was acknowledged, the policies that were put in place were not effective. Current policies remain in need of reform if they are to make a real difference to salinity.

In this paper I argue that much of this sorry history can be attributed to the politics behind the policies. One of my aims

is to explain the contribution of politics to poor salinity policies, in the hope that this understanding may contribute to improved salinity policies in the future. Another aim is to describe the current salinity-related politics and policies, and consider their prospects.

What is politics?

I will take politics to be the full range of social forces influencing government policy. Policy means the government’s laws, regulations, financial programs and their interpretation, administration and supporting structures.

The players

The players in politics may be categorised into at least 5 groups: the voting public, political parties, bureaucracies, interest groups and the media (Table 1). Godden (1997) described the interaction of these players in what he calls ‘political markets’ where the currency is not dollars, but deals, votes and political advantage. The players may have widely differing perspectives (Price 2003) and be in pursuit of widely differing policy outcomes. There is no single dominant theory of how the players interact in political markets to produce policies. Many different conceptual models of the process have been developed, including models in which all players behave altruistically, trying to devise policies that are in the public interest, models in which

all players behave selfishly, pursuing their own welfare, and models in which the process is captured by a dominant interest group (Birkland 2001; Sabatier 1999). Detailed descriptions of these and other political theories are beyond the scope of this paper. I will be focusing on the details of salinity politics and policies in Australia, and assuming that each of these 3 models has some contribution to make in understanding the policy choices that result from the political process.

Within the category of political parties, it is interesting that the inter-party rivalry that figures strongly in many social issues has not been prominent in salinity. Much more prominent in recent times have been the tensions between Commonwealth and State Governments, which currently have an inter-party aspect: the Labour State Governments *v.* the Liberal/National Commonwealth government.

Ministers play a special role in the policy process. They have more individual power than any other player, although even for them, the power to make major changes to program design comes along only occasionally, and is constrained by political and budgetary considerations. A reality of politics is that most ministers are highly concerned about maintaining a positive public profile for themselves in the media and among the community. Some ministers travel great distances at remarkable expense to the public to be present at an event that they judge to be a source of good publicity and profile.

There are exceptions, but most ministers have only a superficial knowledge of the many issues about which they

have to make decisions. Most rely heavily on their advisors for background, advice and speech preparation. Listening to a minister's speech on a topic about which they know little but you know much can be a memorable experience.

Bureaucracies vary widely in their powers, their regional scopes and their characters. Among State and Commonwealth Government agencies, a core concern of agencies is keeping their ministers happy. This includes keeping out of trouble in the media, delivering successfully on any pet projects of the minister or of the ruling party, and responding rapidly to any *ad hoc* requests. Beyond this, agencies are variously concerned with implementing policies, programs and legislation, pursuing the best interests of the public, and capturing resources, powers and responsibilities. Sometimes inter-agency rivalry is an influence on agency behaviour. Such rivalries sometimes arise between agencies with a focus on agriculture and agencies with a focus on the environment.

The other area of tension is between the Commonwealth and the states, as outlined further below. Beresford *et al.* (2001) observed that the states have the power to deal with environmental problems but lack the funds, while the Commonwealth has limited constitutional power but retains the greater financial means. This perhaps overstates the difference, as the Commonwealth has proven able to intervene in environmental issues in a wide variety of ways over the past 20 years, and it might be argued that states do

Table 1. The players in salinity politics

Broad category of players	Elements of the category
The voting public	Divisions with identifiably different views on salinity include: <ul style="list-style-type: none"> • Urban <i>v.</i> rural town <i>v.</i> agricultural • Young <i>v.</i> old • Green <i>v.</i> brown
Political parties	Party politics Commonwealth <i>v.</i> state governments Backbenchers Ministers
Bureaucracies	Commonwealth government agencies State government agencies Local government Murray-Darling Basin Commission Research and development corporations Catchment Management Authorities (with statutory backing)
Interest and advocacy groups	Catchment Management Authorities (without statutory backing) Landcare facilitators and Landcare groups Environmental advocacy organisations Agricultural advocacy organisations Agribusiness and other commercial interests Think tanks/institutes Researchers
The media	Print Television Radio Internet

have substantial resources at their disposal and choose to spend them in other areas.

Lobby groups have been influential in shaping salinity policy at various times. Notably, the Australian Conservation Foundation and the National Farmers Federation joined forces in the late 1980s to successfully lobby for the establishment of the National Landcare Program (NLP) and the Decade of Landcare. More recently, the Wentworth Group of Concerned Scientists have been prominent and appear to have influenced policy directions for water resources.

History of salinity politics and policies

1788–1980

The large-scale clearing of agricultural land in Australia, which has ultimately led to most of our current problems with dryland salinity, occurred with the enthusiastic support of government, community and farmers. Given the politics of the day, there was no prospect for any alternative course of action, and no room for doubt or caution. There were early warnings about the risk of salinity due to excessive clearing, but these were met with indifference, or sometimes with a determination to discredit and sideline scientific evidence.

Government support went far beyond making the land available. Development was supported and accelerated by cheap land prices, research and development (Raby 1996), provision of infrastructure (particularly railways) and, in some cases, heavily subsidised credit (Beresford *et al.* 2001; Bolton 1972). Intensive clearing continued in parts of southern Australia throughout most of the 20th century.

From a political perspective, all of this is understandable. The community and their political representatives alike placed a high value on economic development and on farming as a morally superior employment. There were concerns at times with Australia's ability to feed itself or to generate sufficient export revenue, and concerns about how to retain and employ an expanded post-gold rush population (Frost and Burnside 2001). Agricultural development was the obvious response.

1980–1999

Commencing in the 1980s, concerns about environmental conservation came to have more influence on political decision making in Australia, reflecting a general increase in environmental awareness, especially among urban communities.

Concerted efforts to address salinity in Australia began with the NLP, launched in 1989 from the foundation of the National Soil Conservation Program. Some involved in establishing the NLP seem to have viewed it as a means to raise political support for larger environmental programs. Others apparently believed that land degradation in agriculture could be solved by awareness-raising, education, and catchment planning processes for groups of farmers (Curtis and De Lacy 1997; Vanclay 1997). A stewardship

ethic was to be cultivated among farmers. For over a decade, this paradigm was the dominant force shaping resource management policies for agriculture. The NLP approach was very successful in raising awareness of resource conservation issues among farmers, and in some cases this awareness led to changes in farming practices. It also clearly had benefits in areas other than salinity. However, for dryland salinity, the changes achieved were too small to prevent ongoing resource degradation (Kington and Pannell 2003; Pannell 2001*d*). Barr (1999) notes the inadequacies of relying on voluntarism and a stewardship ethic:

'There is a significant body of research that demonstrates that links between environmental beliefs and environmental behaviour are tenuous,' (p. 134).

The primary instruments used within the Landcare program have been provision of paid facilitators and organisers for Landcare groups (often without strong agricultural or technical backgrounds), the development of catchment plans and farm plans, and subsidies for partial funding of relatively small-scale on-ground works. There has been little economic analysis done of these plans or on-ground works. The NLP was subsumed within the Natural Heritage Trust (NHT) in 1997. Although reported levels of membership of Landcare groups remain high, the program has lost some of its earlier momentum in recent years.

A parallel development was the concept of integrated catchment management (ICM) (Ghassemi *et al.* 1995). The mantra of ICM has had a strong influence on thinking about salinity. One outcome has been a common belief among farmers, agricultural extension agents and others that localised management activities will not generate benefits unless replicated across the entire catchment. Evidence has emerged that in many locations this is not true (e.g. because some groundwater flow systems are localised in extent, or because slow groundwater responses mean that perennials may have localised benefits even in larger scale groundwater systems) (National Land and Water Resources Audit 2001; Pannell *et al.* 2001).

2000–2003

Two reports contributed to an escalation of the political profile of dryland salinity leading up to the new millennium: the 'Salinity audit of the Murray–Darling Basin' (Murray–Darling Basin Ministerial Council 1999) and a report on the impacts of dryland salinity by the Prime Minister's Science, Engineering and Innovation Council (1999). These took the discussion of dryland salinity into Federal cabinet and directly engaged the Prime Minister. Four state governments developed salinity strategies (e.g. Anonymous 2000*b*; New South Wales Government 2000; State of Victoria 2000; State Salinity Council 2000). Media attention to salinity increased dramatically, and the urban community began to be instilled with the sense of a 'crisis'.

Importantly, the scope of public discussions and concerns was broadened beyond agriculture for the first time, with growing recognition of the likely impacts on infrastructure, biodiversity and especially water resources. The consequences of this particular change are still being played out.

The policy outcome was the National Action Plan for Salinity and Water Quality (NAP), announced in October 2000. The NAP was an evolution from Landcare and ICM. The document released to announce the program, 'Our vital resources — national action plan for salinity and water quality' (Anon. 2000a), emphasised 'Integrated catchment/region management plans' to be developed 'by the community'. The community was to be supported in this by the existing facilitator and coordinator support network, by skills development programs, by extension of technical information, and by a major public communication program 'to promote behaviour change and community support'. In all this, the program was similar to previous programs.

Novel elements of the NAP included the setting of targets for salinity, with funding to achieve these targets being directed to community-based groups in the priority regions. Another relatively new element was an improved 'governance framework', including clarification of property rights for water, limits on land clearing and greater use of 'market-based' economic policy instruments (salinity credits, subsidy payments, etc.). A high profile component of the plan with political resonance was airborne geophysics using electro-magnetics and other techniques to identify salt deposits and flows. The then Minister for Conservation was a passionate advocate for this technology, and claims for its ability to target public investments in salinity were apparently used to sell the program to politicians.

States were required to provide new additional funds to secure the Commonwealth funds, on a dollar for dollar basis. The Prime Minister sounded flexible and open to suggestions in his press conference announcing the Plan.

'We are presenting the States with a plan. If they want to change it and they've got some intelligent suggestions we'll pick them up. ... What I am saying is, here's a start. We think this is a good plan. If you've got some sensible changes we'll certainly be ready to talk about them and if they're good changes and they make it better we'll incorporate them into the plan.' (Howard 2000).

In reality, the Commonwealth was not nearly this open to suggestions, and what unfolded was a protracted political struggle. As Eckersley (2003) notes, the federal character of Australia's political system makes it prone to policy gridlock. Negotiations about the NAP between Commonwealth and states dragged on and in some cases descended into acrimony. States slowly signed on: South Australia in June 2001, Victoria in October 2001, Tasmania in February 2002, Queensland in March 2002, New South Wales in May 2002, the Northern Territory in February 2003 and Western Australia in October 2003, 3 years into the 7-year program

(now extended to 8 years due to the delays). The catchment management authorities (CMAs)¹ who were charged with developing integrated catchment plans were understandably frustrated at the delays. A range of factors contributed to the delays, including disagreements about conditions for counting state funds as 'new' funding, disagreement about the almost complete reliance on CMAs to choose funding priorities, concerns by states about funds being directed away from state priorities, and tight state budgets.

Tensions between the reality of politics and the reality of salinity

Urban v. rural

National political priorities are dominated by the concerns of city dwellers. With the exception of parts of western Sydney, the occurrence of salinity is a rural phenomenon, largely invisible to city-dwelling voters.

The high political attention to urban concerns is a natural consequence of the ever-shrinking proportion of the population that resides in rural areas. Most city people have lost all ties to rural areas, other than those with beaches (which may be the only place they personally see much salt in the environment).

Related to this demographic change is the falling relative importance of agriculture within the Australian economy. In 1900, Agriculture contributed around 30% of national gross domestic product (Shaw 1990). The proportion had fallen to 15% by 1960 (Wonder and Fisher 1990), and to 3% by the mid-1990s (Frost and Burnside 2001).

Earlier cultural attitudes towards farming as a morally or spiritually superior occupation are now all but non-existent in city communities. Many city people are now more concerned with the environmental damage caused by agriculture than with the welfare of farmers or the economic productivity of agriculture.

In response, many rural landholders feel put upon and threatened by ill-informed and unreasonable demands for them to bear major costs to protect the environment, most of the benefits of which will be captured by others. This attitude seems particularly prominent in the states of Queensland and New South Wales, where clearing of native vegetation has remained high on the political agenda.

Short-term v. long-term

Good advice on economic policy is often about convincing others that short-term responses are inappropriate. (Alistair Watson, freelance economist). The long time scales over which salinity processes operate will always make it difficult for the issue to be properly considered in politics. Even the shortest lag times in the most

¹Catchment management authorities go by different names and have widely differing powers in different states. For simplicity I will use the label CMAs throughout.

responsive catchments (say 10 years) are long on a political time scale. The long time frames also provide opportunities for cynical politicians to get away with ineffective but politically attractive policies.

I am not suggesting that all political responses are cynical. Some of them are just poorly informed. For example, it is likely that the Prime Minister was not briefed about the likely time lags before making this statement at the press conference announcing the NAP:

‘This amount of money will achieve some practical real outcomes and real improvements at the end of the 7 year period’ (Howard 2000).

Crisis v. slow deterioration

Politicians like a crisis. It attracts the attention of the community, and offers opportunities for heroic and helpful deeds. The community also seems to like a crisis, judging by their reactions to the media. The idea of a crisis of decline in western civilisation has a long history. Herman (1997) traces it back over 4000 years. The environment is only the latest in a long sequence of issues that has satisfied our need for pessimism, and salinity has been more satisfying than even most other environmental issues in this regard. Both Beresford *et al.* (2001) (authors of ‘The salinity crisis’) and Sexton (2003) (‘Silent flood: Australia’s salinity crisis’) understood the marketing power of the crisis word. For a process as slow as dryland salinity, it is hard to justify a sense of crisis in most cases. The rapid change has been in people’s perceptions, rather than in the threat.

A problem with conceiving salinity to be a crisis is that it is likely to prompt urgent and short-term responses, when the real need is for careful consideration and analysis before direct investments are selected, and for industry development activities that are inherently slow.

In addition, there is some unreality in the depicted severity of dryland salinity. Its magnitude has often been overstated. Of the area predicted to become salt affected, only a modest portion will be bare salt scald. Much will be usable by salt tolerant plants, or even by slightly tolerant traditional agricultural plants (albeit with reduced yields). The most widely cited long-term prediction of salt affected land is the 17 million ha published by the National Land and Water Resources Audit (2001). However, this is not the area predicted to be salt affected, but the area ‘at risk’ of shallow water tables. The area that becomes salt-affected will be considerably less than the area at risk (e.g. according to the Land Monitor program and the Australian Bureau of Statistics (2002), a little over 1 million ha of farmland in Western Australia is currently salt affected, whereas the National Land and Water Resources Audit (2001) estimates that over 4 million ha is currently ‘at risk’).

Beyond all that, for a crisis to be worth responding to with an immediate response, there must be actions that will mitigate the adverse conditions that are feeding the crisis.

This is often not the case for salinity. Existing perennial plants are rarely economically competitive with traditional agricultural species if planted on the scale needed to contain salinity (Bathgate and Pannell 2002; Kingwell *et al.* 2003). And even if they were planted on a massive scale, only a proportion of the predicted area of salinity would be avoided. For example, in Western Australia, planting perennials on over half of the agricultural area (e.g. 10 million ha) would avoid only around a quarter of the predicted salinity (reduced from 6.2 to 4.5 million ha) (State Salinity Council 2000). The relevant number from a policy perspective is the 1.7 million ha difference that can be made, rather than the 6.2 million ha most of which is unavoidable.

Even among many farmers with significant areas of salinity, it is not seen as the most pressing or serious of their current problems. In a historical context, salinity ‘can be viewed as simply the latest and by no means the most difficult challenge facing the people who have lived and worked in these lands,’ (Frost and Burnside 2001).

This is not to say that salinity is not a serious problem; it undoubtedly is. My point is that, perhaps with politics in mind, it is common for the seriousness of salinity and the need for urgent action to be overstated.

Simplicity v. complexity

Much of the problem with bad policy comes from smart, articulate people who are operating out of their skill zone. (Gary Stoneham, DNRE Victoria). The skill set required to develop sound salinity policies is very broad, including a range of physical sciences, biological sciences and social sciences. There is a great diversity of issues, some of which are subtle, counter-intuitive and complex. This makes it difficult even to communicate to senior policy players who are not already well informed about salinity.

Politicians do not have the time to properly understand salinity, as the current Prime Minister has noted.

‘There have been so many reports on this. The thing had been the subject of multiple submissions and in the end I got tired of trying to assimilate all of the material and I suggested that we get 4 or 5 people who really understood the issue to draw up an action plan.’ (Howard 2000).

Policy proposals need to be simple and bland enough to achieve inter-governmental agreement, and this can tend to drive decision making to a lowest common denominator (Eckersley 2003). Hamilton (2003) argues that

‘the political process ... remains too immature to deal properly with detailed and reasoned analysis of issues’ (p. 129).

Detailed and reasoned analysis of salinity reveals that it needs a policy framework that is somewhat flexible in response to the needs of different types of salinity impacts, different groundwater systems, and different economic and social situations (Ridley and Pannell 2005). The simple solution of channeling almost all funds through CMAs is not consistent with this. In addition, it is unrealistic to expect the

CMAs to deal with the complexities of salinity in their planning without building into the policy system considerable support with technical and scientific information. This is not currently provided at the level needed.

Complexity and diversity mean that there is no consistent message going to policy makers. Few people are well informed about the full range of salinity issues (which include hydrogeology, economics, biology, engineering options, water resources, the context of commercial agriculture, social aspects, biodiversity, and politics), and many contributions to the public debate are narrowly conceived and poorly justified. This is evident, for example, in the public submissions to the 'Inquiry into the coordination of the science to combat the nation's salinity problem' conducted by the Standing Committee on Science and Innovation, of the Commonwealth House of Representatives (see <http://www.aph.gov.au/house/committee/scin/salinity/subs.htm>, verified 22 November 2005).

Even among relatively well-informed commentators, the nature of the required policy response is disputed. For example, Beresford *et al.* (2001) characterise the problem as lack of sufficient public resources, whereas I judge that total funding is appropriate, but poorly allocated (Pannell 2001a, 2001b). Some expert commentators focus on the need for hydrological data for targeting investments, some on the development of new management options, some on the use of engineering options, some on the importance of communication and education. One has sympathy for policy makers trying to decide whom to believe.

Fairness v. effectiveness

Politicians like everyone to feel that they are winners, or failing that, politicians like to closely control who are the winners and losers. Past policies have sought to maximise farmer participation in salinity abatement practices, creating expectations that public funds will be available to most who are willing to match them with private funds and effort. Apart from being consistent with then current advice that most farmers across the landscape need to contribute to achieve success in salinity abatement, the availability of funding (albeit in small amounts) to large numbers of farmers is very attractive to politicians in rural electorates.

We now appreciate that efficient use of public salinity funds used for on-ground works would require them to be concentrated into small, high priority areas. This is reflected to some extent in the design of the NAP, but with the lack of suitable technical support available to CMAs, it seems clear that most do not appreciate how tight the concentration of funds should be, and even if they did, the pressure from their communities (and their committee members) for funds to be spread more widely and thinly is very difficult to resist.

Expectations seem to be very important in determining what is considered fair. Without the past practices of the

National Landcare Program and the Natural Heritage Trust, it is doubtful that a carefully selective and targeted system of salinity funding would be considered unfair.

It appears that political fairness tends to focus on one dimension of fairness: the expectation of current recipients of funding. For salinity I see 2 other questions about fairness that seem at least as relevant. Is it fair to encourage farmers through joint funding to contribute towards works that will not actually make much difference to salinity? And is it fair to taxpayers to spend tax dollars in programs that will not be very effective in achieving their objectives?

Changing knowledge v. persistent policy

The very existence of a system of funding (e.g. for CMAs) creates considerable political pressure for its continuation. Understandably, those involved in spending the funds actively participate in the political process to endeavour to preserve the system. However our understanding of dryland salinity has changed markedly in the past decade. Given this change, the expectations that have been placed on CMAs are too great; they are not suitable bodies to take responsibility for all Commonwealth salinity funds (Bennett 2004; Pannell 2001a, 2001b).

Another example is the National Landcare Program, which created many new positions for Landcare facilitators. The facilitators are imbued with a particular philosophy of working with farmer groups to address environmental issues on farms. Over time, it has become clear that this approach and philosophy are less effective against salinity than was originally expected. Partly in response to this, the program is undergoing change. However, changing the system is made difficult by the existence of many hundreds of facilitators who are philosophically connected to and financially dependent on the existing system, well connected within bureaucratic and political networks, and able to mobilise the more committed farmers from their groups to fight in defence of the status quo.

So, it can be difficult to reverse a previous decision to spend money in a certain way or through a certain channel. By contrast, there are some aspects of structural arrangements that change often: the committee structures that advise governments, their membership, their names, and the names and organisation of government agencies. It is hard to keep up with the constant changes in these areas. The rapidity of change can be gauged by the fact that a book chapter published in 2003 documenting catchment management institutional arrangements state-by-state (Ewing 2003) was substantially out of date before the end of that year. Pannell *et al.* (2004) provided a snapshot of arrangements as of early 2004.

East v. west

There are a number of factors contributing to political differences between east and west in relation to salinity. For

the purposes of this discussion, the ‘west’ would include those parts of South Australia outside the Murray River catchment.

- Different extents of salinised land. Many first-time visitors from rural areas of the west to rural areas of eastern Australia are struck by how little salinity is visible. Living with large areas of salinity is an unavoidable reality for many western farmers, but not for very many in the east. This difference will persist.
- Different types of resources under threat. In the west, the key salinity concerns relate to salinisation of land, with resultant impacts on agricultural production, infrastructure, biodiversity, and flood risk. In the east, salinisation of land is relevant, but the over-riding concern is with the salinisation of waterways of the Murray–Darling Basin. A political implication of this is that options to live with salinised land are relatively unacceptable in the east because they do not help deal with the issue of highest concern — water resources — whereas they are highly relevant (and indeed essential) in the west. It is notable that recognition of options for living with salinity is completely absent from the NAP document ‘Our vital resources’.
- Different current rates of land clearing. Rates of new clearing in the west (as well as Victoria) have been very low for some years and will be almost non-existent in future. In New South Wales and Queensland clearing has remained a very significant political issue, including in the most recent state election in Queensland. (This is largely because there is more uncleared land remaining in those states.) Options for living with salinity would seem to conflict with the policy agenda to end clearing, given that ‘living with salinity’ might be viewed as condoning or accepting further clearing.
- Different levels of experience with management of salinity. Compared to most of their eastern peers, most farmers in the west have much greater experience at managing salinity on their own properties. They know all too well that small-scale plantings of perennials usually achieve little in the way of salinity prevention. The attitude of many western farmers towards small subsidies for planting perennials is decidedly negative, because they now know that it will draw in their own resources of time and money without helping to prevent salinity. In the east, the farming community is more accepting of policies based on partial subsidies, partly because they can be more effective in some areas, and partly because their inappropriateness in other areas is not widely enough appreciated.

To sum up this section on the tensions between politics and salinity, consider the following observation by Eckersley (2003), who was describing the political difficulties that arise in dealing with environmental issues.

‘This arises because there is no necessary connection between those who create ecological problems, those who have the

expertise to understand them, those who suffer their negative consequences and those who must take political responsibility for them,’ (Eckersley 2003, p. 492).

Prospects

In this section I speculate about where current trends in politics and salinity impacts might take policy and management over the next 10 years.

The National Action Plan

The current round of the NAP will conclude halfway through the 10-year period in question. It seems likely that the broad structure of the NAP will remain as it is until that time, although there are some factors that might prompt earlier changes. One is a growing recognition that most of the CMAs have struggled with the regional planning task they have been set, and that the information they would need to do the job properly is not available at the required resolution or accuracy over enough of the landscape;

If changes are made in the short-term, they might possibly include greater technical support for CMAs, some centralised decision making (bypassing CMAs) about investments using unallocated money, or a further lengthening of the program’s life.

Key weaknesses of the current national salinity program include its neglect of solutions that can only be achieved by government agencies (e.g. legal changes; protection of rural towns, some environmental assets, and some water resources), its neglect of industry development and research and development, its neglect of options for living with salt, and its tendency to divert funds from public to private land. I do not envisage that these weaknesses will be fully addressed until the program has run its course and a subsequent plan is developed.

Beyond the current round of the NAP, at least 3 broad futures are possible:

1. no continuation of a salinity-specific program, with salinity funding included within general funding for the environment and natural resources (as it was before the NAP),
2. continuation of a program largely similar to the NAP, and
3. continuation of a salinity-specific program somewhat different to the NAP.

Of these I consider that 1 is the most likely, and 2 the least likely. Salinity had a period of being the most politically prominent natural resource issue, but this period in the sun has already passed, and the light is now shining on problems of water allocation. The NAP and NHT2 are already treated by CMAs as being 2 parts of the same pool of money, and they are encouraged to do so by the Commonwealth. While this has some advantages in terms of administrative efficiency, it misses the opportunity to emphasise to CMAs that the technical characteristics of salinity mean that it should be treated rather differently to other natural resource problems.

The pilot scheme of ‘market-based instruments’ (i.e. economic policy mechanisms) that is part of the current NAP will not be expanded into a full-blown program, at least not for salinity. Market-based instruments will fade from the salinity agenda and be recognised as only applicable in special situations (Pannell 2001c).

Catchment management authorities

The future of CMAs is hard to predict. I strongly suspect their plans will not deliver the desired outcomes (despite being duly accredited by the program). This fact alone will probably be of little threat to them in the short term – the desired outcomes in regard to salinity prevention are mostly more than a decade in the future, and even after that time has passed it will be arguable as to what would have happened without the CMAs. Of greater threat may be the political debate about whether CMAs are the appropriate body to do the job they have been set for salinity. Bennett (2004) presents a powerful set of arguments that they are not, and he finds a sympathetic ear among senior bureaucrats in some agencies. Dore *et al.* (2003) argue that,

‘with regard to devolving responsibility and power [to CMAs and similar bodies], it is clear that there needs to be ... much more effort put into aligning expectations, objectives and responsibilities with mandates, resources, capacities and powers. Lack of thought on these matters has led to considerable frustration and conflict,’ (p. 177).

Research findings and outcomes

As the recent scientific and economic findings about salinity management become more widely known and accepted, some changes in policy will follow. Investments in salinity prevention will be more carefully targeted and site specific, rather than distributed broadly across rural areas. A proportion of this targeted investment will not be directed to farmers, and much of it will be spent on engineering works. The ‘lucky’ farmers who continue to receive direct financial support for on-ground works will be those who happen to be:

- close to assets of high public value,
- situated on responsive groundwater systems,
- able to grow suitable perennial-based agricultural production systems that are not too much less profitable than traditional agriculture, and
- in locations where the capture of fresh surface water by perennial plants does not outweigh the long-term salinity benefits from reducing groundwater recharge.

Some political tensions will result. Farmers are already concerned that salinity money is not all spent on farms (Industry Commission 1997), and farming lobby groups have regularly stated that it should be.

Current research and development efforts to develop profitable new plant-based systems for salinity management will start to bear fruit. This success will draw in other resources (from both the public and private sectors).

Other institutional possibilities

Some believe that new institutional designs are needed to address some of the failings of current institutions resulting from political pressures. One idea being discussed in some quarters is for the responsibility for delivery of natural resource programs to be removed from government agencies and placed in the hands of a trust. This is a response to concerns about the government’s apparent lack of accountability for achieving outcomes, and to the way that political considerations have impinged on natural resource programs over the past 15 years. The prominent ‘Wentworth group of concerned scientists’ is advocating the establishment of a trust to be responsible for environmental water allocation, but the idea has also been suggested for broader application. The influence of the Wentworth group is currently high, so perhaps they may succeed in having this proposal accepted. However, I envisage that the establishment of an independent trust will be strongly resisted by Commonwealth Government departments.

Funding for Landcare-style group facilitators will continue but will be seen as less relevant to salinity in most regions.

Social trends

Regions within comfortable driving distance of Sydney and especially Melbourne have already seen social and demographic changes resulting from city dwellers purchasing what was formerly extensive farming land and pursuing their rural dreams. In these regions, traditional commercial agriculture has become a less important land use than it once was, occupying a declining proportion of the land, and the trend in this direction will continue (Barr and Wilkinson 2005). It is likely that different policy approaches will be appropriate for this population of new land managers than for primarily commercial farmers. What the difference might be has not yet been seriously analysed.

Attention to the problem of salinity impacts on biodiversity and infrastructure will increase, reflecting increasing awareness by the community.

Beyond policy

Changes in the economics of commercial agriculture, timber production and perhaps energy production and use will play a major role in shaping salinity outcomes and, potentially, salinity policy. Changes in technology, climate, markets and rural communities can be expected, and all are relevant to farmers’ responses to salinity and salinity policies.

Concluding comments

Despite the difficulties and tensions discussed here, the prospects for future salinity policy in Australia do not need to be bleak. Scientific and economic findings are given attention by policy makers (among other considerations). The changes in our knowledge of dryland salinity in the last

decade have been profound. The new findings and their implications are being widely communicated and debated, and one can reasonably hope that the next national salinity policy will deal appropriately with what we now believe to be the physical, biological, economic and social realities of dryland salinity.

In addition, politics and policy are not the only influence, or even necessarily the main influence, on salinity outcomes. The new scientific knowledge will influence land managers, irrespective of policy. Long-term outcomes in salinity management will be substantially influenced by demographic changes in some regions, and by the results of current research and development to develop profitable new plant-based systems for salinity management.

Within agriculture, irrespective of policy, a reasonable balance will eventually be reached between engineering and plant-based approaches to salinity management, and between preventative and adaptive strategies. One hopes that, despite some of the political difficulties, a reformed national salinity policy will contribute significantly to that outcome.

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References

- Anonymous (2000a) Our vital resources: a national action plan for salinity and water quality. Agriculture, Fisheries and Forestry Australia and Environment Australia: Canberra. Available at <http://www.napsqw.gov.au/publications/vital-resources.html>, [verified 22 November 2005]
- Anonymous (2000b) 'Draft state dryland salinity strategy, South Australia.' (Soil Conservation Council of South Australia and Government of South Australia: Adelaide)
- Australian Bureau of Statistics (2002) Salinity on Australian farms. report 4615.0. Australian Bureau of Statistics, Canberra.
- Barr N (1999) Social aspects of rural natural resource management. In 'Outlook 99. Proceedings of the national agricultural and resources outlook conference, Canberra. Vol. 1'. pp. 133–140. (Commodity Markets and Resource Management, ABARE: Canberra)
- Barr N, Wilkinson R (2005) Social persistence of plant-based management of dryland salinity. *Australian Journal of Experimental Agriculture* **45**, 1495–1501.
- Bathgate A, Pannell DJ (2002) Economics of deep-rooted perennials in Western Australia. *Agricultural Water Management* **53**, 117–132. doi:10.1016/S0378-3774(01)00160-3
- Bennett D (2004) Rethinking community-based integrated catchment management. In 'Dryland salinity: economic issues at farm, catchment and policy levels'. (Eds TW Graham, DJ Pannell, B White) pp. 207–220. (CRC for Plant-Based Management of Dryland Salinity, University of Western Australia: Perth)
- Beresford Q, Bekke H, Phillips H, Mulcock J (2001) 'The salinity crisis: landscapes, communities and politics.' (University of Western Australia Press: Perth)
- Birkland TA (2001) 'An introduction to the policy process: theories, concepts, and models of public policy making.' (ME Sharpe: Armonk, NY)
- Bolton G (1972) 'A fine country to starve in.' (University of Western Australia Press: Perth)
- Curtis A, De Lacy T (1997) Examining the assumptions underlying Landcare. In 'Critical landcare, key papers series 5'. (Eds S Lockie, F Vanclay) pp. 185–199. (Centre for Rural Social Research, Charles Sturt University: Wagga Wagga, NSW)
- Dore J, Woodhill J, Andrews K, Keating C (2003) Sustainable regional development: lessons from Australian efforts. In 'Managing Australia's environment'. (Eds S Dovers, S Wild River) pp. 154–180. (Federation Press: Sydney)
- Eckersley R (2003) Politics and policy. In 'Managing Australia's environment'. (Eds S Dovers, S Wild River) pp. 485–500. (Federation Press: Sydney)
- Ewing S (2003) Catchment management arrangements. In 'Managing Australia's environment'. (Eds S Dovers, S Wild River) pp. 393–412. (Federation Press: Sydney)
- Frost F, Burnside D (2001) Appreciating and creating our history, dealing with salinity in wheatbelt valleys: processes, prospects and practical options. In 'Papers, proceedings and outcomes of the field tour/conference/workshop'. (Water and Rivers Commission: Perth)
- Ghassemi F, Jakeman AJ, Nix HA (1995) 'Salinisation of land and water resources: human causes, extent, management and case studies.' (University of New South Wales Press: Sydney)
- Godden D (1997) 'Agricultural and resource policy: principles and practice.' (Oxford University Press: Melbourne)
- Hamilton C (2003) Resource assessment commission: lessons in the venality of modern politics. In 'Managing Australia's environment'. (Eds S Dovers, S Wild River) pp. 117–132. (Federation Press: Sydney)
- Herman A (1997) 'The idea of decline in western history.' (Free Press: New York)
- Howard J (2000) Transcript of the Prime Minister, the Honourable John Howard MP, press conference on natural resource management, Parliament House, Canberra, 10 October 2000. Available at <http://www.pm.gov.au/news/interviews/2000/interview475.htm>, [verified 22 November 2005]
- Industry Commission (1997) 'A full repairing lease: inquiry into ecologically sustainable land management, draft report, September 1997.' (Industry Commission: Canberra)
- Kington EA, Pannell DJ (2003) Dryland salinity in the upper Kent River catchment of Western Australia: Farmer perceptions and practices. *Australian Journal of Experimental Agriculture* **43**, 19–28. doi:10.1071/EA01058
- Kingwell R, Hajkowicz S, Young J, Patton D, Trapnell L, Edward A, Krause M, Bathgate A (2003) 'Economic evaluation of salinity management options in cropping regions of Australia.' (Grains Research and Development Corporation: Canberra)
- Murray–Darling Basin Ministerial Council (1999) 'The salinity audit of the Murray–Darling Basin, a 100 year perspective, 1999.' (Murray–Darling Basin Commission: Canberra)
- National Land and Water Resources Audit (2001) 'Australian dryland salinity assessment 2000.' (National Land and Water Resources Audit: Canberra)
- New South Wales Government (2000) 'Taking on the challenge: NSW salinity strategy.' (NSW Department of Land and Water Conservation: Sydney)
- Pannell DJ (2001a) Dryland salinity: economic, scientific, social and policy dimensions. *Australian Journal of Agricultural and Resource Economics* **45**, 517–546. doi:10.1111/1467-8489.00156
- Pannell DJ (2001b) Salinity policy: a tale of fallacies, misconceptions and hidden assumptions. *Agricultural Science* **14**, 35–37.
- Pannell DJ (2001c) Harry Potter and the pendulums of perpetual motion: economic policy instruments for environmental management, connections. *Farm, Food and Resource Issues* **1**, 3–8.

- Pannell DJ (2001d) Explaining non-adoption of practices to prevent dryland salinity in Western Australia: implications for policy. In 'Land degradation'. (Ed. A Conacher) pp. 335–346. (Kluwer: Dordrecht)
- Pannell DJ, McFarlane DJ, Ferdowsian R (2001) Rethinking the externality issue for dryland salinity in Western Australia. *Australian Journal of Agricultural and Resource Economics* **45**, 459–475. doi:10.1111/1467-8489.00152
- Pannell DJ, Ridley A, Regan P, Gale G (2004) 'Catchment management bodies in four Australian states: structures, legislation, and relationships to government agencies, CRC for Plant-Based Management of Dryland Salinity.' (University of Western Australia: Perth)
- Price R (2003) My picture's bigger than your picture: as if size matters. In 'Proceedings of the 9th PURSL national conference. Yeppoon, Qld'. Available at http://www.pursl.com/pdf/pdf05/op_Price_Richard.pdf [verified 25 November 2005]
- Prime Minister's Science, Engineering and Innovation Council (1999) 'Dryland salinity and its impact on rural industries and the landscape, Prime Minister's Science, Engineering and Innovation Council, occasional paper number 1.' (Department of Industry, Science and Resources: Canberra)
- Raby G (1996) 'Making rural Australia: an economic history of technical and institutional creativity.' (Oxford University Press: Melbourne)
- Ridley A, Pannell DJ (2005) The role of plants and plant-based R&D in the management of dryland salinity in Australia. *Australian Journal of Experimental Agriculture* **45**, 1341–1355.
- Sabatier PA (1999) 'Theories of the policy process (Theoretical lenses on public policy).' (Westview Press: Boulder, CO)
- Sexton M (2003) 'Silent flood: Australia's salinity crisis.' (ABC: Sydney)
- Shaw AGL (1990) Colonial settlement 1788–1956. In 'Agriculture in the Australian economy'. (Ed. DB Williams) pp. 1–18. (Sydney University Press: Sydney)
- State Salinity Council (2000) 'Natural resource management in Western Australia: the salinity strategy.' (Government of Western Australia: Perth)
- State of Victoria (2000) 'Victoria's salinity management framework, restoring our catchments.' (Department of Natural Resources and Environment: Melbourne)
- Vanclay F (1997) The social basis of environmental management in agriculture: a background for understanding landcare. In 'Critical landcare, key papers series 5'. (Eds S Lockie, F Vanclay) pp. 9–27. (Centre for Rural Social Research, Charles Sturt University: Wagga Wagga, NSW)
- Wonder B, Fisher B (1990) Agriculture in the economy. In 'Agriculture in the Australian economy'. (Ed. DB Williams) pp. 50–67. (Sydney University Press: Sydney)

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