

# Piloting a systematic framework (SIF3) for public investment in regional natural resource management in dryland salinity in Australia

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## Introduction

Many countries including Australia have partly devolved natural resource management (NRM) to regional bodies defined on watersheds (catchments) (Ewing 2003, Gutrich *et al.* 2005). In Australia there are 56 such regional organisations, involving some level of community partnerships. Institutional arrangements vary in each state. Victorian Catchment Management Authorities have had statutory powers since 1997, whereas in Western Australia regional bodies are incorporated non-profit associations, independent from government. Resourcing of regions occurs largely through direct and indirect funding from national and state governments.

The main Australian program addressing salinity in recent years has been the National Action Plan for Salinity and Water Quality (NAP). Efforts have focussed on providing extension and small, temporary grants to landholders in the hope that the resulting land-use changes would be sufficient to have environmental benefits. Pannell (2001) argued that the approach was fundamentally flawed for the following reasons: (a) that there were few technical options that were attractive enough for farmers to adopt at a scale needed to address the problem, even allowing for the available financial support; (b) that applying persuasion, peer pressure and distributing information to encourage a conservation ethic was insufficient to prompt farmers to change management over the scale needed; (c) that community-based regional bodies would be unable to resist community pressures that would lead to poor prioritisation of investments; and (d) that there were major changes in the scientific knowledge of salinity, indicating that it is much more difficult to manage than previously hoped, and that the design of the NAP did not reflect this knowledge or include processes to disseminate it.

Following advocacy by Pannell to the state government bodies in Western Australia, two iterations of a more systematic decision framework, the Salinity Investment Framework (SIF), versions 1 (McAlinden *et al.*, 2003) and 2 (Sparks *et al.*, 2006), were developed and piloted. From this a national framework, now called SIF3, was developed (Ridley and Pannell 2005, [www.sif3.org](http://www.sif3.org)). This paper reports on the implementation of SIF3 with two regional bodies – the North Central Catchment Management Authority (NCCMA) in Victoria and South Coast Natural Resource Management (SCNRM) in Western Australia.

## Methods

Piloting the SIF3 framework consisted of the following stages:

- (a) Consultation, communication and establishing relationships with stakeholders, including conducting of a field tour, understanding local knowledge, institutional relationships, and science.
- (b) Identifying high-value natural resource assets, distinguishing between localised assets (discrete, high-value assets in particular locations, e.g. a wetland, which are likely to have high public benefits from investment) and dispersed assets (groups of assets that are spread across the region, such as agricultural land, or the many small parcels of remnant native vegetation on farms). We used a combination of official government recognition (e.g. Ramsar listing), high community value and local scientific knowledge to identify localised assets.
- (c) Assembling data required to conduct the analysis. Data were obtained from a wide range of sources including government data sets, local expert opinion, published and unpublished reports, observations of landholder behaviour/attitudes and interviews with landholders and extension staff.

(d) Conducting the SIF3 analyses which resulted in a short list of recommended interventions, which then required detailed assessment of feasibility prior to investment.

(e) Testing and refining the recommendations after presentation to stakeholders.

We also developed and maintained active engagement with policy makers and policy advisers at both state and national levels through: (a) briefings in person or through email at strategic times in the project's life; (b) inviting their input into the design and process of implementing our work; and (c) responding promptly to queries and concerns.

## Results and discussion

Once we had assembled the relevant data and information it was straightforward to apply SIF3 to derive recommendations. We identified the need for several changes to tables published by Ridley and Pannell (2005), and these amendments can be found on [www.sif3.org](http://www.sif3.org). We also identified a number of important data deficiencies and were able to provide feedback to stakeholders about priority areas for research. Expert and local knowledge was at least as important as available data.

Active communication to relevant groups was of crucial importance for acceptance of the framework. This was more difficult and time consuming than the application itself. Without such active and broad-ranging communication, this work would not have had impact in changing investment decision making at the regional level, and in creating an environment for broader potential change at the state and national levels. The project provides a salutary lesson to researchers aspiring to change institutional and policy arrangements: the research is likely to be by far the easiest part.

Through the various communication activities, we recognised the need to more clearly explain the underlying logic of the framework. From this realisation, we developed the public benefits: private benefits framework, which presented graphically part of the core logic of SIF3 as it applies to changes on private land (Pannell 2008). This proved to be a particularly powerful communication tool, giving confidence to people that the logic of SIF3 was sound, and removed some of the "black box" feel of the original framework. The public benefits: private benefits framework has become a useful tool in its own right and will be used as an underpinning, generic component as we broaden the framework to encompass threats other than salinity.

The differences between current action and SIF3 recommendations were greater for the NCCMA than for SCNRM. In both regions there was strong emphasis on extension, often accompanied by small, temporary incentives. Neither region had adequately addressed the adoptability of on-ground interventions when planning their interventions. In both regions, recommendations from SIF3 for treatment of dispersed assets were mostly for technology development to develop more profitable perennial plant-based options. Experience from Victoria in particular highlights the negative consequences of neglecting adoptability, where after 6 years of concerted extension and payment of grants, adoption of perennials had occurred in a relatively untargeted way on only 5-20 per cent of lands, far below the area needed to mitigate salinity.

Figure 1 shows the priority regions (left hand side) in the NCCMA region that received incentives and extension under the NAP, compared with the results for protection of localised highest value assets (right hand side). The previous priority regions were in locations with large areas of salinity-threatened agricultural land, with some consideration of salt loads in waterways. The predominant investment response was extension, supported by small, temporary grants to encourage trialling of new practices. There was no consideration of other types of threatened assets such as wetlands, native vegetation, or infrastructure, and almost no consideration of other policy tools. The highest-value localised assets were not protected, and it was unlikely that worthwhile NRM outcomes would be achieved. A paper by Beverly *et al.* (*this conference*) explores the issue of where in the landscape to invest to protect some of these high value assets.

In the SCNRM, a fuller range of asset types was considered, and selection of priority assets in each asset class had been made based on a set of criteria adapted from SIF1/2. However, there was still resistance by some stakeholders to a rigorous approach to targeting. Some of the priority areas selected were too large and some investments lacked a clear link to NRM outcomes. The main policy tools for localised asset protection were extension and small, temporary incentives, but there was some recognition of the role for engineering, with it being the key investment for one asset, and of technology development to protect agricultural assets.

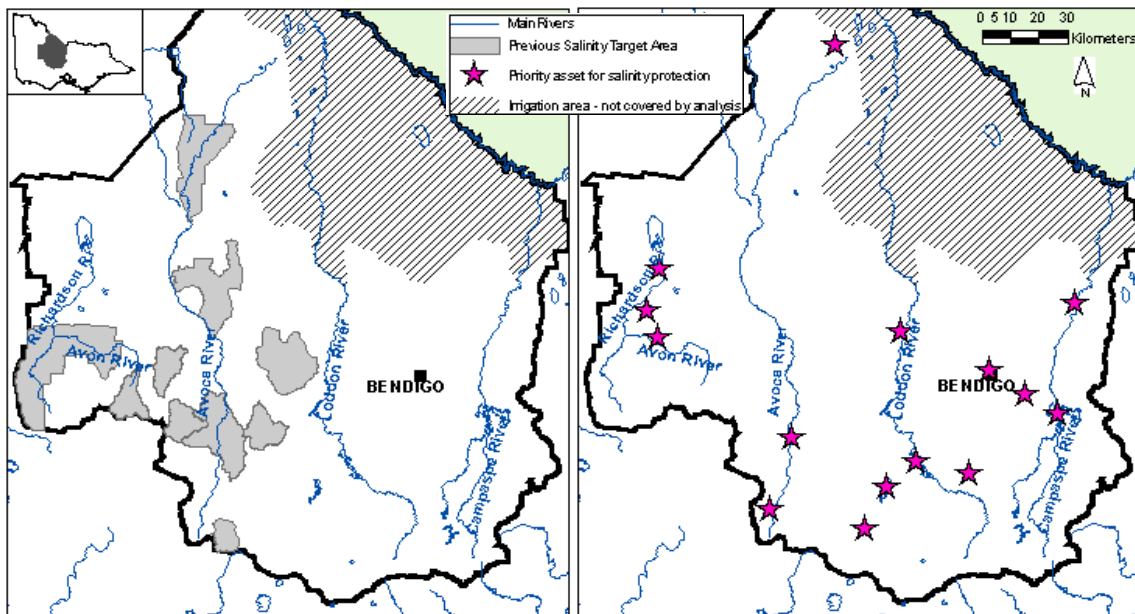


Figure 1 Comparison of salinity priority areas under the previous approach (left hand side) with localised high-value assets identified as priorities for protection using SIF3 (right).

The SIF3 pilots have strongly influenced both regional NRM bodies. The pilot in Victoria was completed earlier (in mid 2006), and so the NCCMA is more advanced in adapting its activities in response. It has re-written its dryland management plan (the plan under which investments are made), based largely on SIF3. The NCCMA is also keen to embrace the next phase of our work, called INFFER (Investment Framework for Environmental Resources) where we will broaden the framework to encompass multiple environmental threats. The NCCMA wish to use INFFER as the basis of their Regional Catchment Strategy in 12-18 months time, and are now working rapidly to adopt an asset-based approach over the whole region. SCNRM has only recently received the results (late 2007) but a number of steps have already been taken in response to the pilot, indicating a high likelihood of some changes to future investment. As reported by Alexander *et al.* (*this conference*) several other regions in Victoria have also expressed interest, as has the South West Catchment Council in WA. Evaluation of SIF3 with the NCCMA is discussed by Park *et al.* (*this conference*).

The experience of piloting SIF3 in these two regions has revealed a number of implications for policy. Most importantly, we believe that the pilots have demonstrated that it is feasible to apply SIF3 to select NRM investments that are likely to yield more valuable environmental and natural resource outcomes than currently. SIF3's focus on outcomes is much needed. Existing programs such as NAP and NHT imposed by government funders have encouraged activity and expenditure of funds.

There is evidence of influence on policy makers from this project. At the national level, discussion of SIF3 in the report of an inquiry into salinity by a committee of the Senate (the upper house of the national government), included a recommendation to keep a watching brief on the development of SIF3, with a view to potentially implementing it (or a modified version of it) across the country, in the post-2008 program (Anon. 2006). The Victorian State Government led development of a paper presented to peak multi-government policy committees, including principles for future public

investment in salinity, largely based on SIF3. The paper was endorsed in 2006 by the NRM Standing Committee (consisting of senior officers from each state and national government) and in 2007 by NRM Ministerial Council (consisting of relevant ministers from each state and national governments). Adam Hood (*this conference*) reports on this process.

Despite these positive developments, achieving the policy changes to which we aspire remains elusive. Australian governments appear unwilling to mandate the use of SIF3 (or any other framework) as a condition of funding to regional NRM bodies, preferring to support a process of voluntary uptake. We are concerned that regional bodies have few incentives to pursue NRM outcomes cost effectively, but remain hopeful that stronger incentives to do so will be introduced eventually.

### **Conclusions**

SIF3 proved easy to apply and highly relevant to regional natural resource managers. There is need for more targeted investment in localised assets if salinity outcomes are to be achieved. SIF3 recognises the need for investment in both localised and dispersed assets and highlights the need for a broader range of policy tools to be used than currently. Results highlight that there has been excessive reliance on extension and small, temporary grants to landholders, and that these tools are unlikely to result in enduring changes in land management of sufficient scale to achieve worthwhile NRM outcomes. Our analysis points to greater reliance on engineering, larger grants, regulation, and technology development. Our success in implementing SIF3 owes much to the strategies employed, including strong communication, collaboration, consultation, fostering local champions, and being responsive to the needs and time lines of the NRM bodies. We also formed close links to the government bodies that provide funds and guidance to the regional bodies. An active campaign to influence policy makers and policy advisers has been promising so far and we are hopeful of further success.

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### **References**

Alexander, JK, Ridley AM and Pannell, DJ (2008). Victorian catchment management approaches to salinity investment (*this conference*).

Anon. (2006) Environment, Communications, Information Technology and the Arts References Committee. Living with Salinity - A Report on Progress. The Extent and Economic Impact of Salinity in Australia, Government of Australia, Canberra.

**Beverly, C , Ridley, A and Hocking M (2008). Protecting high-value assets from salinity in the Avon Richardson catchment, Australia (*this conference*)**

**Ewing, S (2003). Catchment Management Arrangements. Chapter 16. In: Dovers, S. and Wild River, S. (Eds.) Managing Australia's Environment. The Federation Press, Leichhardt, pp. 393-412.**

Gutrich, J, Donovan, D, Finucane, M, Focht, W, Hitzhusen, F, Manopimoke, S, McCauley, D, Norton, B, Sabatier, P, Salzman, J, Sasmitawidjaja, V. (2005). Science in the public process of ecosystem management: lessons from Hawaii, Southeast Asia, Africa and the US Mainland. *Journal of Environmental Management* 76, 197-209.

- Hood, A (2008). Dryland salinity in Australia – Next steps - Ministerial Council salinity investment principles (*this conference*)
- McAlinden, D, Sparks, T, Burnside, D and Stelfox, L (2003). Salinity Investment Framework Interim Report – Phase I, Report No. SLUI 32, Department of Environment, Perth.
- Pannell, DJ (2001). Salinity policy: A tale of fallacies, misconceptions and hidden assumptions, *Agricultural Science* 14(1), 35-37.
- Pannell, DJ (2008). Public benefits, private benefits, and policy intervention for land-use change for environmental benefits, *Land Economics* (in press).
- Park, G, Alexander, JK, Ridley, AM and Pannell (2008). Transforming planning and practice for regional natural resource management: lessons from SIF3 in North Central Victoria (*this conference*).
- Ridley, AM and Pannell, DJ (2005). The role of plants and plant-based research and development in managing dryland salinity in Australia. *Australian Journal of Experimental Agriculture* 45, 1-15.
- Sparks, T, George, R, Wallace, K, Pannell, D, Burnside, D and Stelfox, L (2006). Salinity Investment Framework Phase II, Report No. SLUI 34, Department of Water, Perth Western Australia, 86 pp.