

Support for implementers: extending the science

The problem of diminishing extension services has come out very clearly in this inquiry. A gap is occurring in some areas regarding somebody being able to take the information through to the farmer on the ground.¹

- 8.1 This chapter reviews the adequacy of the technical and scientific support for land managers who implement salinity management options. The chapter is split broadly into two parts. First, general themes relating to extension and its purpose are addressed and second, current arrangements for extension provision are discussed.
- 8.2 The general themes covered include the role of extension services in community capacity building and the dissemination of technical and scientific knowledge relating to salinity management. This includes:
- a discussion of the information required by implementers (paragraphs 8.7–8.13);
 - the methods of delivering extension services (paragraphs 8.14–8.30); and
 - the necessary skill base of extension staff (paragraphs 8.31–8.32).
- 8.3 Subsequently, the effectiveness of current arrangements for the transfer of information about salinity management to land managers (particularly farmers and catchment management organisation (CMO) staff²) are reviewed. Covered in this section are the contributions of:

1 Dr Robin Batterham (Chief Scientist), *Transcript of Evidence*, 24 November 2003, p. 18. Also see: Mr Kevin Goss (Murray-Darling Basin Commission), *Transcript of Evidence*, 3 November 2003, p. 8.

2 Under the *National Action Plan for Salinity and Water Quality*, farmers and CMOs are recognised as key implementers of natural resource management programs (Council of Australian

- state extension services (paragraphs 8.37–8.65);
- national extension initiatives and regionally delivered extension services (paragraphs 8.66–8.121);
- direct extension of research by scientists, and private sector involvement (paragraphs 8.122–8.146); and
- local governments (paragraphs 8.147–8.154).

Extension services: a means to disseminate knowledge

8.4 *A National Action Plan for Salinity and Water Quality* (the NAP), identified the promotion of scientific findings beyond universities and research organisations as vital to building the capacity of individuals and community groups, including CMOs, responsible for implementing and applying salinity management options.³ Although the Committee recognises that the transfer of information alone will not solve the problem of salinity, it agrees with the Grains Research and Development Corporation's (GRDC) view that: 'ensuring that farmers have low-cost access to accurate information ... and access to interpretive advice, will facilitate their decision-making for salinity management'.⁴

8.5 The term 'extension' has come to refer, in the Australian vernacular, to the provision of agricultural advice to farmers by state agency staff: '*the department of agriculture offers an extension service to farmers*'.⁵ According to the Australasia-Pacific Extension Network (APEN):

Extension involves the use of communication and adult education processes to help people and communities identify potential improvements to their practices, and then provide them with the skills and resources to effect these improvements.⁶

8.6 For the purposes of this report, 'extension' refers to public and private sector community capacity building and knowledge dissemination activities, promoting the management of salinity and other natural

Governments (COAG), *A National Action Plan for Salinity and Water Quality*, Australian Government Departments of Agriculture, Fisheries and Forestry (DAFF) and the Environment and Heritage (DEH), Canberra, 2000).

3 *Ibid.*, p. 6.

4 Grains Research and Development Corporation (GRDC), *Exhibit no. 79, Economic Evaluation of Salinity Management Options in Cropping Regions of Australia*, p.iv.

5 *The Macquarie Concise Dictionary*, The Macquarie Library, Adelaide, 1988, p. 332.

6 The Australasia-Pacific Extension Network website, viewed 26 February 2004, <www.apen.org.au/APEN/index.htm>.

resource issues. The aim of 'extension' is to assist land managers to practise sustainable natural resource management (NRM), by encouraging behavioural change and supporting the implementation of sustainable land-use practices.⁷ Service delivery methods include field-days, seminars, on-farm trails, grower group meetings, publications, media reports, the internet and traditional style extension services. Professionals engaged in providing extension services to implementers are given a range of titles including extension officers, NRM facilitators, implementation officers, knowledge brokers, community service officers et cetera. Increasingly research scientists, agribusiness staff and NRM consultants are also involved in extension provision.⁸

Salinity management options that meet the needs of land managers

- 8.7 A key message from the *National Dryland Salinity Program* (NDSP), after a decade of salinity research, was that a '[l]ack of capacity is an important, but secondary constraint, to managing salinity'.⁹ Indeed, the NDSP submitted that:

The biggest constraints for moving forward lie in the lack of clarity of rights and responsibilities, nailing attribution between cause and effect and being able to clearly specify the benefits and costs of different courses of action.¹⁰

- 8.8 The Australian Institute of Agricultural Science and Technology (AIAST) expressed the view that:

In general, action on salinity problems is not restricted by information – or communication of that information. Action is prevented by a lack of political will, misdirection of funding and the insurance crisis ... the production of 'information' on the

7 During site inspections in New South Wales, Western Australia and Victoria the Committee witnessed the capacity of many land managers, particularly farmers, to understand, use and contribute to the NRM science base, and in turn to manage sustainably the natural resources in their custody.

8 For a broad discussion on the state of extension services also see: The Australasia-Pacific Extension Network, *Extending Extension: beyond traditional boundaries, methods and ways of thinking*, Hobart, viewed 26 February 2004, <www.regional.org.au/au/apen/2003/papers/>; Cullen P., Cottingham J.D., Doolan J., Edgar B., Ellis C., Fisher M., Flett D., Johnson D., Sealie L., Stocklmayer S., Vanclay F. and Whittington J., Cooperative Research Centre for Freshwater Ecology, *Knowledge Seeking Strategies of Natural Resource Professionals*, Canberra, viewed 26 February 2004, <<http://freshwater.canberra.edu.au>>.

9 *Focus on Salt: The Newsletter of Australia's National Dryland Salinity Program*, Issue no. 29, December 2003, p.1, viewed 18 March 2004, <www.ndsp.gov.au/15_publications/publications.html>.

10 National Dryland Salinity Program (NDSP), *Submission no. 35*, p. 29.

salinity problem is now such that dealing with this information is a problem in itself.¹¹

8.9 The New South Wales Farmers' Association stated:

If the farmers are talking to the scientists they want to be told the extent of the problem. But, most importantly ... they need some options in terms of solutions. It is no good just taking a problem to the farmers without some feasible options.¹²

8.10 Similarly, Greening Australia submitted that:

The worst outcome is to raise the willingness of a landholder to take action but then not be in a position to inform them on appropriate action. As one farmer recently commented at a salinity workshop:

*You mean to tell me that you want to tell me how to manage my land, but when you get there you can't tell me what to do!*¹³

8.11 As discussed in previous chapters of this report, submitters have noted that if research outcomes are to be widely adopted they must meet the needs of land managers, by being:

- proven to manage salinity effectively;
- complementary to broader NRM efforts;
- economically viable;
- low risk and simple to implement;
- supported with the funding necessary for their implementation;
- at the scale required by the land manager.¹⁴

8.12 The New South Wales Government told the Committee that:

A large amount of useful scientific information already exists that provides simple solutions to salinity problems, but these are often not implemented due to [a] lack of information relating to economics, potential impact or awareness. For local solutions to be

11 AIAST, *Submission no. 76*, p. 1.

12 Mr Andrew Huckel (New South Wales Farmers' Association), *Transcript of Evidence*, 29 October 2003, p. 46.

13 Greening Australia, *Submission no. 79*, p. 1.

14 New South Wales Farmers' Association, *Submission no. 45*, p. 3. Also see: Dr Donald McFarlane (Western Australian Salinity Research and Development Technical Committee), *Transcript of Evidence*, 12 November 2003, p. 351; Western Australian Salinity Research and Development Technical Committee (WA SRDTC), *Submission no. 54*, pp. 2-3; Australian Salinity Action Network (ASAN), *Submission no. 39*, p. 8; GRDC, *Submission no. 29*, p. 11.

adopted, they need to be realistic, suitable and at least as profitable as current systems.¹⁵

8.13 The Prime Minister's Science, Engineering and Innovation Council (PMSEIC) concluded that science had failed to produce viable management options:

Experiences with agricultural extension over the last 50 years has shown that for farmers to change, the change needs to be simple, divisible so they can try it in a limited area, and the results need to be obvious in economic terms. Salinity control measures fail on each of these elements. The challenge is to evaluate management options in situation-specific terms that give farmers the confidence to invest.¹⁶

Delivery methods

8.14 The Committee notes that scientific information on salinity and NRM issues is extended in a variety of forms, including:

- electronic distribution of material via the internet and databases, for example:
 - ⇒ the New South Wales Government's database Community Access to Natural Resources Information (CANRI);¹⁷
 - ⇒ at a national level, the National Land and Water Resources Audit works with the Australian Government Departments of Agriculture, Fisheries and Forestry (DAFF) and the Environment and Heritage (DEH) to maintain a digital data library and an atlas of Australian Natural Resources;¹⁸
 - ⇒ Land and Water Australia's (LWA) Practical Index of Salinity Models (PRISM) CD-ROM which contains information on over 90 different tools to assist CMOs manage salinity;¹⁹
 - ⇒ the 'Saltlist' email forum coordinated by the NDSP;²⁰

15 Government of New South Wales, *Submission no. 61*, p. 10.

16 PMSEIC, *Dryland Salinity and its Impacts on Rural Industries and the Landscape*, Commonwealth Department of Education, Science and Training, Canberra, 1998, p. 16, viewed 29 January 2004, <www.dest.gov.au/science/pmseic>.

17 Government of New South Wales, *Submission no. 61*, p. 4. The CANRI website is available at <www.canri.nsw.gov.au>, viewed 17 February 2004.

18 DAFF and DEH, *Submission no. 72*, p. 5.

19 See chapter four.

20 For information on Saltlist see the NDSP's website, viewed on 17 February 2004, <www.ndsp.gov.au/25_whats_on/SALTLIST_email_forum.html>.

- written information such as scientific journals, issue specific journals, pamphlets, newsletters and technical manuals, for example:²¹
 - ⇒ *Saltland Pastures in Australia: A Practical Guide* published by Land, Water & Wool Sustainable Grazing on Saline Lands Sub-program²²;
 - ⇒ *Focus on Salt* by the NDSP;²³
 - ⇒ *Managing Dryland Salinity* booklets published by the Murray Darling Basin Commission (MDBC) synthesising knowledge generated by the Commission's Dryland Program;²⁴
 - ⇒ *Landholder Guide to Land and Water Management* by the Kyeamba Landcare Group;²⁵
 - ⇒ the proposed *Salinity Glove Box Guide* by the Southern Salt Action Team;²⁶
- through the media, in particular the radio and television, for example:
 - ⇒ the *Silent Flood* series which was screened by the Australian Broadcasting Corporation;²⁷
- a variety of face-to-face methods such as field days, conferences, on-farm trials, grower group meetings, grower workshops, and traditional style extension services, for example:
 - ⇒ state or CMO extension officers delivering face-to-face extension to land managers;
 - ⇒ the Productive Use and Rehabilitation of Saline Lands group (PUR\$L) bi-annual conferences for government, industry groups and farmers.²⁸

21 The Committee received 132 exhibits. Many were originally written to communicate information about, and advice on, salinity and its management.

22 Land and Water Australia (LWA), *Exhibit no. 70, Saltland Pastures in Australia: A Practical Guide*.

23 *Focus on Salt: The Newsletter of Australia's National Dryland Salinity Program*, viewed 18 March 2004 < http://www.ndsp.gov.au/15_publications/publications.html>.

24 Murray-Darling Basin Commission (MDBC), *Exhibit no. 41, Managing Dryland Salinity – Draft Report*.

25 Mr Sydney Clarke, *Exhibit no. 45, Landholder Guide to Land and Water Management*.

26 *Scientific Advice on Natural Resource Management: A Report to the Natural Resource Management Ministerial Council by the Commonwealth Scientific and Industrial Research Organisation and the Commonwealth Bureau of Meteorology*, report presented to the NRMCC, Adelaide, February 2004, p. 30.

27 DAFF and DEH, *Submission no. 72*, p. 12.

28 *ibid.*, p.13.

Consolidating information: a national database or one-stop-shop

8.15 Despite the work of the NDSP, a number of submitters noted the need to bring salinity literature together, through a national database or a one-stop-shop.²⁹

8.16 With regard to the establishment of a national database, Land and Water Australia (LWA) submitted:

I am not aware of any jurisdiction that has the gold standard yet in making that information user-friendly and having it in every transaction centre, shire council and primary school. But the technology and machinery is such that we should not be very far away from that, and that is what we should be aspiring to. I can see a time where each agricultural adviser or farm consultant would just sit at the kitchen table, plug in their laptop and have a CD-ROM or log onto a web site to pull up that sort of information. It could be linked with farm-scale telemetry that is satellite-linked to have the catchment-scale data and the farm-scale data in the same system. That is where we should be headed, but we have not joined all the dots in any part of Australia...³⁰

8.17 Similarly the GRDC stated:

where the knowledge is available, those who need to get access cannot access it readily. There is no one database where you can get information about salinity management or information relevant to land use change.³¹

8.18 The GRDC recommended that a national database of salinity information be developed. It was suggested that it could be modelled on the New South Wales Government's Salinity Research and Development Coordinating Committee's meta-database for state salinity projects.³²

8.19 The Committee is aware of NRM databases, or 'atlases', which contain some salinity research and general information, basic modelling tools, and metadata information. These include the Australian Government's Natural Resources Atlas, the New South Wales Government's CANRI, the Western Australian Land Information System (WALIS), and the South Australian Atlas.³³

29 GRDC, *Submission no. 29*, p. 11; New South Wales Farmers' Association, *Submission no. 45*, p. 5.

30 Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 30.

31 Dr Martin Blumenthal (GRDC), *Transcript of Evidence*, 7 November 2003, p. 70.

32 New South Wales Department of Agriculture website, viewed 7 April 2004, <www.agric.nsw.gov.au/reader/salinity-srdcc>.

33 These can be accessed on the Australian Government's NRM website, viewed 19 April 2004, <www.nrm.gov.au/data/index.html>.

- 8.20 The Murray Catchment Management Board told the Committee that CANRI did not fulfil its needs:

practitioners or the planners often do not have the time, the energy or even the ability to wade through a 3,000-page scientific document to decipher what it is all about. What we propose on this side is there should be some central repository where a lot of that scientific information is condensed down to layman's terms.³⁴

- 8.21 The New South Wales Farmers' Association supported the idea of a 'one-stop-shop' for salinity management, which would incorporate a human interface to assist users to access collated material.³⁵ The Wagga Wagga City Council has made a proposal under the NAP funding guidelines to become a national coordinating body for education on urban salinity management: *The One Stop Shop for Managing Urban Salinity*.³⁶ However, the New South Wales Government cautioned that it had found one-stop-shops were an ineffective way of providing NRM advice, as implementers continued to contact the relevant state agencies for information.³⁷

- 8.22 During the review of the *National Landcare Program* it was recommended that 'A Landcare Information Storehouse' be established. It was argued that an electronic database containing the outcomes, successes and failures of Landcare projects would assist Landcare groups and networks, landholders and industry gain access to and share information.³⁸ The Committee sees the merit of this proposal. Such a project could be a major contributor in a national salinity database for both interpreted and raw data.

34 Mr Anthony Dawson (Murray Catchment Management Board), *Transcript of Evidence*, 30 October 2003, p. 16.

35 New South Wales Farmers' Association, *Submission no. 45*, p. 5.

36 Wagga Wagga City Council, *Exhibit no. 7, The One Stop Shop for Managing Urban Salinity*.

37 Dr Michael Curll (Government of New South Wales, Department of Agriculture), *Transcript of Evidence*, 29 October 2003, pp. 85-86. Also see: Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 28.

38 Review of the National Landcare Program, DAFF, Canberra, October 2003, p. 50, viewed 19 April 2004, <www.daff.gov.au/corporate_docs/publications/pdf/nrm/landcare/nlp_review_report_final.pdf>.

Recommendation 15

8.23 **The Committee recommends that the Australian Government in cooperation with the states and territories build on existing initiatives to establish a database of interpretive material, scientific research and data, related to salinity and its management. The three levels of the database should be:**

- (a) a ready reference salinity component, containing concise, integrated, accurate, and easy to understand information to assist land managers, particular farmers, catchment management organisation staff and natural resource management extension officers;**
- (b) links to salinity related research papers endorsed by the *National Dryland Salinity Program* or its successor body;**
- (c) a meta-data component identifying the location of available salinity data and, where possible, the capacity for a storage and retrieval system for salinity related data particularly that collected for the *National Action Plan for Salinity and Water Quality*.**

For implementation, this recommendation should be read in conjunction with recommendations 1 and 3.

Face-to-face extension

8.24 It was submitted that face-to-face contact with qualified, competent and trusted extension staff or facilitators was an effective method of providing information and transferring skills to land managers.³⁹ Extension officers can act as conduits between scientists, the knowledge base of NRM, and implementers: collecting, interpreting, filtering, translating and promoting scientific information.⁴⁰

8.25 The Committee heard from the Western Australian Farmers' Federation that the 'human factor ... is not given enough credibility in this debate':

there are some farmers who are quite happy to use the Internet and get all the information they need off that, but there are those who still prefer the face-to-face across the kitchen table approach.

39 Mr Alex Marshall (Murray Irrigation Ltd), *Transcript of Evidence*, 31 October 2003, p. 15.

40 For the purposes of this report professionals engaged in providing scientific and technical support and information to implementers will be referred to generically as 'extension staff'.

As old-fashioned as it might sound, it is the most effective way of doing things.⁴¹

8.26 Similarly, the New South Wales Farmers' Association told the Committee that:

When it comes down to it, a lot of farmers communicate orally – by word of mouth. They like the advisor to come out and talk to them ... They need an explanation of a problem and a solution and most importantly that needs to be achieved through a relationship of trust; that is how they communicate.⁴²

8.27 The Commonwealth Scientific and Industrial Research Organisation (CSIRO) noted that to translate science into action on the ground 'you need somebody ... to come and explain to the locals or the CMAs'.⁴³ Similarly, Mr Philip Dyson considered that alternative modes of transferring information such as the internet and publications, are of limited value for local Landcare coordinators:

At the end of the day, after working a long day, coming in and trying to look up information on a computer or read the fantastic reports that we produce is something that they would all like to do. But, having worked with them throughout eastern Australia, I know they are very limited in their capacity to take on information in a written form and in web form.⁴⁴

8.28 The New South Wales Farmers' Association advised that only 30 per cent of its members had internet access.⁴⁵

8.29 According to Murdoch University, extension staff are able 'to do some of the running around' for land managers, who often have neither the time, nor requisite skills, to extract the information they require.⁴⁶ In addition to collecting information, competent extension staff can interpret, filter,

41 Mr Andrew McMillan (Western Australian Farmers Federation), *Transcript of Evidence*, 13 November 2003, p. 12. Also see: Mr Alex Marshall (Murray Irrigation Ltd), *Transcript of Evidence*, 31 October 2003, p. 15.

42 Mr Jonathan Streat (New South Wales Farmers' Association), *Transcript of Evidence*, 29 October 2003, p. 46. Similar views were expressed by Mr Philip Dyson (Phil Dyson and Associates Pty Ltd), *Transcript of Evidence*, 31 October 2003, p. 3.

43 Dr Mirko Stauffacher (CSIRO), *Transcript of Evidence*, 7 November 2003, p. 88.

44 Mr Philip Dyson (Phil Dyson and Associates Pty Ltd), *Transcript of Evidence*, 31 October 2003, p. 3. Also see: Mr Sydney Clarke, *Transcript of Evidence*, 30 October 2003, p. 6.

45 Mr Andrew Huckel (New South Wales Farmers' Association), *Transcript of Evidence*, 29 October 2003, p. 47.

46 Associate Professor Richard Bell (Murdoch University), *Transcript of Evidence*, 13 November 2003, p. 29.

translate, integrate and promote scientific information which meets the needs of their target audience.⁴⁷

- 8.30 Rather than being a purely top-down transfer of information, the delivery of extension is becoming responsive to the need of land managers, who are requesting the information they require and providing scientists with new ideas and innovations.⁴⁸ The Western Sydney Regional Organisation of Councils (WSROC) stated:

Two-way communication and feedback that is timely and constructive is critical in linking research and those who need to implement solutions. Communication from researchers and technologists must be able to distil complex technical and theoretical concepts into a user friendly format for land managers, policy makers and decision makers. Constructive feedback from users to researchers and technologists is essential to allow refining of assumptions, systems and tools to improve their application and effectiveness in real world situations.⁴⁹

The necessary skill base of extension staff

- 8.31 The Committee heard that good extension staff need a range of skills and attributes, which include:
- a multi-disciplinary knowledge of NRM issues, and practical knowledge of farming systems and salinity management options;
 - good research and analytical skills;
 - the ability to translate and communicate complex information, and isolate and collate information relevant to their audience;
 - flexibility and skills to deal with, and present information to, a diverse range of people;
 - credibility with, and trust of, their audience.⁵⁰

47 *ibid.*

48 Associate Professor Richard Bell (Murdoch University), *Transcript of Evidence*, 13 November 2003, p. 29. Also see: Mr Sydney Clarke, *Transcript of Evidence*, 30 October 2003, p.6; Dr Mirko Stauffacker (CSIRO), *Transcript of Evidence*, 7 November 2003, p. 89.

49 WSROC, *Submission no. 20*, p. 6.

50 Dr Martin Blumenthal (GRDC), *Transcript of Evidence*, 7 November 2003, p. 71. Also see: Dr Baden Williams, *Submission no. 1*, p. 4; Mr Philip Dyson (Phil Dyson and Associates Pty Ltd), *Transcript of Evidence*, 31 October 2003, p. 7; Mr Sydney Clarke, *Transcript of Evidence*, 30 October 2003, p. 9. The Hon. Dr Sharman Stone MP, *Transcript of Evidence*, 31 October 2003, p. 44.

8.32 The Committee acknowledges that the success of salinity management depends on the commitment and actions of individuals and community groups, in particular CMOs. Therefore it is vital that research findings for salinity management are extended effectively to meet their needs. The weight of evidence indicates that face-to-face extension is an effective delivery method for farmers and community organisations. The Committee concludes that good face-to-face extension with experienced and trusted extension staff can lead to a more rapid and widespread adoption of new technologies and management options. The Committee also recognises that the extent to which extension staff can induce wide-scale changes may be limited by the effectiveness, economic viability, scale and complexity of the management options presented.⁵¹

Recommendation 16

8.33 **The Committee urges relevant Australian, state and territory government agencies and industry groups to enhance their support for face-to-face extension services by ensuring that there are adequate numbers of qualified extension staff available to assist land managers, particularly farmers.**

Recommendation 17

8.34 **The Committee recommends that the Australian Government, in partnership with the relevant state government agencies, compile and publish a state by state manual of viable salinity management options, to assist extension staff and land managers. This manual should be updated regularly, and survey current best practice approaches to salinity management. It should also be available free of charge in both hard copy and on the internet to extension staff and land managers dealing with salinity problems.**

51 Mr Tim Sparks (Western Australian Department of the Environment), *Exhibit no. 111, Salinity: A New Balance*, p. 46.

The provision of extension services

- 8.35 The extension of NRM information to landholders has traditionally been the responsibility of state and territory governments.⁵² Recently, in addition to state extension officers, extension is being provided via alternative sources, for example;
- CMO facilitators;⁵³
 - landholders and community organisations sharing information between individuals and through Landcare activities with the aid of Landcare facilitators;⁵⁴
 - private industry promoting science as it sells products to landholders (eg. Landmark),⁵⁵ and consultants providing extension services on a fee-for-service basis;⁵⁶
 - scientists and research organisations extending their research directly to land managers;⁵⁷ and
 - local governments which employ dedicated extension staff.⁵⁸
- 8.36 The Committee heard that CMOs and landholders consult a range of sources depending on their perceptions of a source's credibility; the type and scale of the information they require; and the relative ease of accessing a source:
- depending on who the farmers are, it could be a Wesfarmers Landmark agent, it could be a scientist from CSIRO, it could be a government agency extension officer or it could be through a Landcare group. A whole range of people get involved here ... none of them gets above 30 or 40 per cent, even the industries. So it is how you support all of that in its diversity, because that is what it is.⁵⁹

52 Dr Michael Curll (Government of New South Wales, Department of Agriculture), *Transcript of Evidence*, 29 October 2003, p. 89.

53 Mr Andrew Huckel (New South Wales Farmers' Association), *Transcript of Evidence*, 29 October 2003, p. 50. Also see: Mrs Mary Howard (Hawkesbury-Nepean Catchment Management Board), *Transcript of Evidence*, 29 October 2003, p. 67.

54 Mr Sydney Clarke, *Transcript of Evidence*, 30 October 2003, p. 5.

55 Landmark, *Submission no. 30*, pp. 1-3.

56 For example, Phil Dyson and Associates Pty Ltd (*Submission no. 46*) and Sinclair Knight Merz (*Submission no. 28*) were two consulting companies who submitted to the inquiry.

57 Dr Thomas Hatton (WA SRDTC), *Transcript of Evidence*, 12 November 2003, p. 36.

58 Wagga Wagga City Council, *Submission no. 5*, p. 2.

59 Mr Kevin Goss (MDBC), *Transcript of Evidence*, 3 November 2003, p. 18.

Traditional extension: state and territory government extension services

- 8.37 As outlined in chapter two, most state and territory governments have developed salinity strategies, and are involved in providing extension services for NRM. The Committee received evidence from the Governments of New South Wales, Western Australia and South Australia on their extension services. It is beyond the scope of this report to catalogue all the NRM or salinity extension programs undertaken by the states and territories.⁶⁰ Salient examples of positive state extension initiatives were brought to the Committee's attention during the course of the inquiry, and evidence on the general status of state/territory extension services was received.⁶¹
- 8.38 State and territory government agencies have traditionally been the main providers of NRM extension services.⁶² Evidence was presented that state extension officers were a crucial and effective means of 'bridging the gap' between scientists and landholders. Indeed, the Australian Nuclear Science and Technology Organisation (ANSTO) submitted that 'State agencies provide the most effective way for scientists and on-ground managers to communicate'.⁶³
- 8.39 The New South Wales Government submitted that the current processes for delivering extension were working well in New South Wales,⁶⁴ and information was being transferred through a range of activities:

In the case of state agencies, the knowledge that we generate is usually transferred to farmers, rural communities and industry groups through a range of processes, including formal and informal extension education programs—in particular, what we

60 For example, in the South Australian Government's Dryland Salinity Strategy there is a strong emphasis on supporting CMOs and other land managers. The types of extension 'actions' undertaken in South Australia, with regard to dryland salinity include: long-term catchment support teams based in the regions; a key interdisciplinary service provider hub for dryland salinity management, linked to regional service providers; the provision of targeted and sound information for land managers. See: Primary Industries and Resources SA and the Soil Conservation Council of South Australia, *South Australian Dryland Salinity Strategy*, Adelaide, 2001, pp. 24-26, viewed 23 February 2004, <www.saltcontrolsa.com/pdfs/sadss_72.pdf>. For further information on extension arrangements see the 'salinity strategies' relevant to each state and territory (as outlined in chapter two of this report).

61 See for example: Mr Kevin Goss (MDBC), *Transcript of Evidence*, 7 November 2003, p. 41; Mr Philip Dyson (Phil Dyson and Associates Pty Ltd), *Transcript of Evidence*, 31 October 2003, p. 4.

62 Dr Michael Curll (Government of New South Wales, Department of Agriculture), *Transcript of Evidence*, 29 October 2003, p. 89.

63 Australian Nuclear Science and Technology Organisation (ANSTO), *Submission no. 22*, p. 4.

64 Dr Michael Curll (Government of New South Wales, Department of Agriculture), *Transcript of Evidence*, *ibid.*

call experiential learning activities, publications, field days and demonstrations.⁶⁵

- 8.40 These ‘activities’ were facilitated by the state’s ‘frontline extension advisory officers’.⁶⁶ The Department of Infrastructure, Planning and Natural Resources (DIPNR) and New South Wales Agriculture employ the State’s NRM extension staff. In the New South Wales Government’s submission it was stated that in excess of 400 extension staff are employed between the departments. However, other evidence from the New South Wales Government indicated this figure was only 200.⁶⁷
- 8.41 For specialist information on salinity, extension officers refer questions to one of the State’s six Salt Action Teams, also staffed by the two departments.⁶⁸ As a key initiative of the *NSW Salinity Strategy (2000)*, the Salt Action Teams have a four year budget allocation of \$9.4 million.⁶⁹
- 8.42 The role of the Salt Action Teams, according to the New South Wales Government, ‘is to facilitate the adoption of on-ground change and to facilitate the transfer of technology, skills and knowledge from agencies’ technical staff to catchment and landscape level’.⁷⁰ To access the expertise of the Salt Action Teams, landholders must first contact extension officers from DIPNR, New South Wales Agriculture and, when they are set up, the State’s Catchment Management Authorities (CMAs).⁷¹
- 8.43 The Salt Action Teams were described to the Committee as:
- teams of agency specialists, scattered strategically across the state. One focuses on urban matters and five focus mostly on rural matters ... They get out there, they channel the best science into CMA thinking and they channel the best science into private sector provider activities. We do a lot of work in training private sector providers so that the Elders and the CRCs of this world are up to speed with the science and the best available options.⁷²

65 *ibid.*, p. 77.

66 *ibid.*

67 Government of New South Wales, *op. cit.*, p. 6. Dr Michael Curll (Government of New South Wales, Department of Agriculture), *Transcript of Evidence*, 29 October 2003, p. 85.

68 Dr Michael Curll (Government of New South Wales, Department of Agriculture), *Transcript of Evidence*, *ibid.* Also see: Government of New South Wales, *Submission no. 61*, p. 5.

69 Government of New South Wales, *Submission no. 61*, p. 5. Also see: New South Wales Department of Land and Water Conservation, *Taking on the Challenge: NSW Salinity Strategy – Update: Premier’s Annual Report 2000/01*, Government of New South Wales, Sydney, 2000, viewed 27 January 2004, <www.dlwc.nsw.gov.au/care/salinity/pdf/salinity_strategy_update.pdf>.

70 Government of New South Wales, *Submission no. 61*, p. 5.

71 Dr Michael Curll (Government of New South Wales, Department of Agriculture), *Transcript of Evidence*, *ibid.*

72 *ibid.*, p. 89.

8.44 The Murrumbidgee Catchment Management Board noted:

[t]he establishment of the Salt Teams as brokers for research and extension has certainly improved the situation ... However, we still find that utilisation of these Salt Teams is not optimal and intend to address this in the future.⁷³

8.45 To 'keep abreast of major research outcomes', the Salt Action Teams gather scientific information on salinity from an a range of sources 'including the DIPNR Centre for Natural Resources, New South Wales Agriculture, relevant Cooperative Research Centres, CSIRO, and the Bureau of Rural Sciences'.⁷⁴

8.46 In light of the expertise held in state agencies, state extension staff have an important role in training and linking with industry and non-government agencies that deliver land management advice. Landmark agronomy staff in New South Wales, Western Australia and Victoria have undertaken salinity training with state government specialist salt advisors, to ensure they are able to provide 'the best advice to clients'.⁷⁵

8.47 During the course of the inquiry the Committee observed first-hand the work of departmental officers performing extension roles in New South Wales and Western Australia. The professionalism of staff from the Western Australian Departments of Agriculture and Environment, and the New South Wales Southern Salt Action Team, and the extent to which they work in partnership with community groups, such as Landcare and individual landholders, is commendable. The Committee also notes the credibility these officers have with land managers.⁷⁶

8.48 The Committee concludes that state extension services have many strengths which it would be difficult for other organisations to replicate, including: their long and sustained relationship with the farming community; their capacity to make sustainable NRM decisions based on the best scientific information available (independent of commercial imperatives); and their ability to plan works across farm, and even catchment, boundaries to achieve broad scale environmental outcomes.

73 Murrumbidgee Catchment Management Board, *Submission no. 43*, p. 2.

74 Government of New South Wales, *loc. cit.*

75 Westfarmers Landmark, *Westfarmers Landmark National Salt Smart Strategy*, viewed 26 February 2003, <www.wesfarmerslandmark.com.au>.

76 Mr Andrew McMillan (Western Australian Farmers' Federation), *Transcript of Evidence*, 13 November 2003, p. 2. Also see: Mr Rex Edmondson (WA SRDTC), *Transcript of Evidence*, 12 November 2003, p. 35.

Problems with state extension services

- 8.49 The diminishing and de-skilling of state and territory extension services was an issue raised by a number of submitters.⁷⁷ This trend has been identified as an issue of concern in a range of public policy documents.⁷⁸
- 8.50 The Western Australian Farmers' Federation told the Committee:
Over the years in Western Australia the Department of Agriculture, particularly, has had its extension service eroded from a very effective interface between farming and government to virtually nothing.⁷⁹
- 8.51 Similarly, Mr Philip Dyson noted:
It would be fair to say that the farmers around here do have a pretty good relationship with their extension officers, although there are very few of those people around any more—compared to what I would have called extension officers 10 or 15 years ago. A lot of the people you are talking about are now landcare coordinators and those kinds of people.⁸⁰
- 8.52 A related trend has been the de-skilling of extension staff. The GRDC stated that '[t]here is an enormous skill shortage of people who understand salt movement, water movement, agronomy and land use change to be able to integrate the processes that need to take place'.⁸¹
- 8.53 According to the Australian Society of Soil Science Incorporated (ASSSI) the de-skilling of state extension staff has meant that they lack the capacity to assist the newly forming CMOs.⁸² This view was countered by the Lower Murray Darling Catchment Management Board which was satisfied with the technical and scientific support provided by DIPNR.⁸³

77 See for example: Dr Thomas Hatton (WA SRDTC), *Transcript of Evidence*, 12 November 2003, p. 36. Also see: CSIRO, *Submission no. 42*, p. 14; Mr Kevin Goss (MDBC), *Transcript of Evidence*, 3 November 2003, p. 8; Dr John McGrath (Forest Products Commission of Western Australia), *Transcript of Evidence*, 12 November 2003, p. 13.

78 See for example: Industry Commission, *A Full Repairing Lease: An Inquiry into Ecologically Sustainable Land Management*, Canberra, April 1999, p. 10, viewed 2 October 2003, <www.pc.gov.au/ic/inquiry/finalreport/index.html>; House of Representatives Standing Committee on Environment and Heritage, *Co-ordinating Catchment Management*, Canberra, December 2000, p. 119, viewed 17 March 2004, <www.aph.gov.au/house/committee/envIRON/reports.htm>.

79 Mr Andrew McMillan (Western Australian Farmers' Federation), *Transcript of Evidence*, 13 November 2003, p. 2.

80 Mr Philip Dyson (Phil Dyson and Associates Pty Ltd), *Transcript of Evidence*, 31 October 2003, p. 4.

81 Dr Martin Blumenthal (GRDC), *Transcript of Evidence*, 7 November 2003, p. 71. Also see: Dr Baden Williams, *Submission no. 1*, p. 4.

82 Australian Society of Soil Science Incorporated (ASSSI), *Submission no. 68*, p. 2.

83 Lower Murray Darling Catchment Management Board, *Submission no. 2*, p. 2.

- 8.54 It was submitted to the Committee that state extension services are not attracting and retaining adequately skilled staff because there are no clear career pathways for them to follow, salaries are generally low and they are usually employed on short term contracts.⁸⁴ The New South Wales Farmers' Association stated:

the extension officer role is that area of natural resource management that has been neglected through funding arrangements and structures—three-year terms and such approaches. It does not allow an option for an extension officer to settle in an area. He or she has uncertainty of tenure, which means that they do not build a relationship with the land-holder and a relationship with the scientist.⁸⁵

- 8.55 Similarly, ASSSI noted the problems associated with short-term funding cycles and the departure of extension staff:

It is typical of State-government agencies to re-allocate staff to (often disjointed) projects receiving external funds, which last for only between 2 and 5 years. As an example, many of the salinity extension-staff in New South Wales are funded only until the end of 2003. Similarly, the Queensland Department of Natural Resources & Mines has gradually cut its salinity staff to the point where there remain only a handful of scientists for the whole of Queensland. Funding cuts, re-allocation and departure of staff invariably deplete the critical mass of valuable experience and knowledge gained during periods of short-term funding.⁸⁶

- 8.56 Murdoch University noted that state extension had become a training ground for university graduates, and once they gained experience there was a tendency for them to move into more stable and lucrative employment in the public sector.⁸⁷ In this regard the Western Australian Salinity Research and Development Technical Committee (WA SRDTC) told the Committee:

On the economics side, we really do need people to have skills we are not currently giving them in the field. They tend to be people who are in a state agency—say the Department of Agriculture—and they understand the industries and pick up those skills and

84 Associate Professor Richard Bell (Murdoch University), *Transcript of Evidence*, 13 November 2003, p. 30.

85 Mr Jonathan Streat (New South Wales Farmers' Association), *Transcript of Evidence*, 29 October 2003, p. 46.

86 ASSSI, *Submission no. 68*, p. 2.

87 Associate Professor Richard Bell (Murdoch University), *Transcript of Evidence*, 13 November 2003, p. 30.

become very valuable over five, six or eight years. But to take new graduates out of universities and put them into regional areas and expect them to sell a very complicated message like salinity to people who are managing multimillion dollar businesses, is a big ask.

One of our pleas is to invest a lot more in those people and give them time to develop, give them careers and give them the access to the skills so that they can provide an information brokering role between the scientists and the land managers particularly.⁸⁸

8.57 According to the New South Wales Farmers' Association, the turnover of extension staff results in land managers being 'presented with a continuous rotation of ideas and personalities'.⁸⁹ Similarly, the Western Australian Farmers' Federation told the Committee that state extension services should be reinvigorated.⁹⁰

8.58 LWA considered the withdrawal of extension was an issue worthy of review:

From my perspective, Australia needs to be having a hard look at the way in which we deliver extension services using modern technology, using industry, using non-government organisations. I am not saying for a moment that we should have fleets of public servants in government cars in a return to the 1950s or 1960s. The private sector can deliver a lot of this, but we need to recognise that for problems across farm boundaries with a strong public good dimension it is just unrealistic to expect that the private sector is going to pick that up. We actually need skilled people who can work at a landscape scale on these public good issues, but who are literate in the farming systems that are needed to solve the problem at the end of the day.⁹¹

8.59 Sinclair Knight Merz (SKM) submitted that good staff could be retained 'as long as career structures exist and salinity is seen as an area where people can work for the long term'.⁹² However, SKM concluded that state agencies could no longer hold all the necessary knowledge on salinity 'in house', and that private sector providers now had a necessary and

88 Dr Donald McFarlane (WA SRDTC), *Transcript of Evidence*, 12 November 2003, p. 36.

89 Mr Jonathan Streat (New South Wales Farmers' Association), *Transcript of Evidence*, 29 November, p. 46.

90 Mr Andrew McMillan (Western Australian Farmers' Federation), *Transcript of Evidence*, 13 November 2003, p. 2.

91 Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, pp. 25-26.

92 Sinclair Knight Merz (SKM), *Submission no. 28*, p. 6.

established role in the delivery of extension services.⁹³ Professor Philip Cocks, from the Cooperative Research Centre for Plant-Based Management of Dryland Salinity (CRC PBMS), told the Committee:

I think we still have to use the conventional methods—the state government extension agencies—but I would reiterate what I believe is the importance of this partnership with private industry. It need not be just Landmark; there are a number of other private companies. They have the capacity to have face-to-face relationships with virtually every farmer in Australia. That is certainly not true of the state agencies.⁹⁴

8.60 The withdrawal of state extension services has been accompanied by an increase in the involvement of private industry, the Australian and local governments, CMOs and scientists.

8.61 Mr Kevin Goss, in his capacity as Deputy Chief Executive of the MDBC, summarised the current state of extension services:

There is a long-term trend with public agencies of withdrawing from servicing farmers with free-to-farm services. That is well advanced and almost complete, I suppose, in straight commercial advice. There has been a substitution for that with funding positions with Landcare and NHT now taking over, particularly in the catchment management framework. But there is a mature commercial consulting industry around natural resource management and around salinity now, and it can contribute an enormous amount.⁹⁵

8.62 The Committee notes the trend of state and territory governments withdrawing from the provision of extension services in their traditional form. Nevertheless, the weight of evidence indicates that these services are of tremendous value to landholders. The Committee urges state and territory governments to review this issue, with particular regard to the employment conditions of extension officers; their potential career pathways; and the adequacy of the training provided for officers to ensure their knowledge of technical, scientific and policy issues, relating to NRM and in particular salinity, is current and comprehensive.

8.63 The Committee notes that there is a tension between the need for generalist and specialist extension staff in NRM. Indeed, while not diluting a focus on salinity, technical and scientific support for salinity management should be integrated within broader NRM objectives. The

93 *ibid.*

94 Professor Philip Cocks (CRC PBMS), *Transcript of Evidence*, 13 November 2003, p. 18.

95 Mr Kevin Goss (MDBC), *Transcript of Evidence*, 7 November 2003, p. 41.

use of specialist salt teams to assist generalist extension staff is an effective compromise. The Committee commends the New South Wales Government on the establishment of the Salt Action Teams, and sees this as a positive step in the provision of expert advice on the complex issue of salinity. Other state governments are urged to consider the Salt Action Teams as a potential model for providing on-ground salinity expertise to assist NRM extension officers around the country.

- 8.64 The Committee is also aware that several states are addressing the issue of extension in partnership with the Australian Government and industry groups through national and regional NRM programs. The following section discusses national and collaborative approaches to the delivery of extension services.

Recommendation 18

- 8.65 **The Committee recommends that the relevant Australian Government agencies in consultation with state and territory governments review the issue of diminishing state extension services, with a particular focus on:**
- (a) the employment conditions of extension staff;**
 - (b) the potential career pathways of extension staff; and**
 - (c) the adequacy of the training provided for extension staff to ensure their knowledge of technical, scientific and policy issues, relating to natural resource management and in particular salinity, is both current and comprehensive.**

Support from national NRM programs for extension

- 8.66 LWA submitted that the task of assessing the adequacy of the Australian Government's role in the provision of salinity extension is complicated by a lack of comprehensive data:

As a national science funding agency we cannot even get a list of the facilitators and coordinators being funded by the Australian government.⁹⁶

96 Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 26.

Recommendation 19

- 8.67 **The Committee recommends that the Australian Government, in cooperation with the states, undertake an audit of the national, state and regional extension services available for salinity management, and natural resource management more generally.**

The National Landcare Program and Landcare Australia

- 8.68 In its submission, Landcare Australia claimed that many Australian farmers ‘get their information on reversing land degradation from the landcare group network’.⁹⁷ Landcare has established 4 000 voluntary Landcare groups and 40 per cent of practising farmers are members.⁹⁸

- 8.69 The activities undertaken by Landcare groups are an excellent example of experiential learning where farmers learn-by-doing. To support activities, and in turn the regional delivery of information, the *National Landcare Program* (NLP) funds facilitators and coordinators to assist community Landcare groups:

The National Landcare Program also provides complementary functions to regional planning. For example, the NLP fosters the landcare ‘movement’ which has been growing for more than a decade, it provides landcare facilitators and coordinators to connect communities to information sources and services, and it supports Landcare groups and landcare-minded individuals to implement on ground actions for natural resource management. Landcare is also supported by the NHT through which it operates with other well-established groups, Bushcare, Rivercare and Coastcare.⁹⁹

- 8.70 Mr Sydney Clarke, a farmer from the Wagga region (New South Wales), shared his views on Landcare and the importance of NLP facilitators:

One of the major issues which comes up is getting the science from the knowledge base to the farmer through some sort of activity. That activity has to be Landcare ... Certainly, we need a coordinator to transport the science from the science block, so to speak, to the farmers through the medium of Landcare activities in

97 Landcare Australia Ltd, *Submission no. 49*, p. 3.

98 *ibid.*

99 DAFF and DEH, *Submission no. 72*, p. 8.

a Landcare group. So it is imperative that we keep coordinators to assist in getting the science to the farmer.¹⁰⁰

- 8.71 Mr Philip Dyson told the Committee that Landcare coordinators were able to get communities involved in regional projects, and thus it was vital they be supported:

The big issue is that it is very hard to get to catchment communities unless you have the landcare coordinators, the salinity coordinators and the information providers in each of the regions tuned up to deliver the information. It is at that level that we need to provide knowledge, information and, above all, mentorship to look after those people. A lot of them are very isolated.¹⁰¹

- 8.72 As members of the local farming community, it was suggested that Landcare coordinators could best be supported through face-to-face extension with salinity and NRM experts, and not inundated with written or web-based information.¹⁰²

- 8.73 In its report *Salinity: A New Balance*, the Western Australian Salinity Taskforce stated that the Landcare program had ‘been successful in raising awareness of resource conservation issues among farmers, and in some cases this awareness has lead to changes in farming practices’.¹⁰³ However, the Taskforce had reservations about the Program’s ability to facilitate sufficient land-use changes to prevent resource degradation caused by dryland salinity:

To be fair, the land-use changes required to prevent salinity effectively are now known to be very much more substantial than was believed when the Landcare program was conceived.¹⁰⁴

- 8.74 The Australian Government recognises that Landcare has ‘undergone significant changes’ with the shift to the regional delivery of NRM services, and that the support arrangements at regional and local levels are ‘insufficient for the effective engagement of community landcare in regional planning and plan implementation’.¹⁰⁵ As a result, in October

100 Mr Sydney Clarke, *Transcript of Evidence*, 30 October 2003, p. 8.

101 Mr Philip Dyson (Phil Dyson and Associates Pty Ltd), *Transcript of Evidence*, 31 October 2003, p. 3.

102 *ibid.*

103 Mr Tim Sparks (Western Australian Department of the Environment), *Exhibit no. 111, op. cit.*, p. 52.

104 *ibid.*

105 DAFF, *National Resource Management: State Landcare Coordinators*, DAFF, Canberra, viewed 21 February 2004, <www.affa.gov.au/content/output.cfm?&OBJECTID=1F8F9C07-6A88-4256-BB5C5B76507A127E>.

2003, regional and state facilitators were recruited by the NLP. Funds were provided in the Australian Government's 2004 Budget for 70 Landcare facilitators.¹⁰⁶ Facilitators will work in conjunction with NAP facilitators to support regional planning initiatives. It is anticipated that state level facilitators will:

support and communicate Australian Government policies, programs, and priorities, in particular, in relation to the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality, engage relevant government, industry and community stakeholders in relation to one of the four broad NRM themes [land, river, bush and coast] and coordinate the facilitator and coordinator network effort overall.¹⁰⁷

- 8.75 The role of regional level facilitators will be to assist CMOs to develop and implement their regional plans, by collating and translating government policies, information and resources within each region. Furthermore facilitators will focus on encouraging industry participation in regional NRM initiatives.¹⁰⁸
- 8.76 The Committee concludes that Landcare activities are vital to the transfer of information on salinity and its management. While acknowledging reservations about Landcare's ability to facilitate sufficient land use change in its current form, the Committee does not believe this detracts from Landcare's role in the communication and dissemination of information about salinity. Indeed, it further highlights the need for better management options to be developed by researchers, and the strengthening of the mechanism by which information is transferred from researchers to extension providers.
- 8.77 Although in its infancy, the effectiveness of NLP facilitators in the design and implementation of regional plans will need to be assessed, and their roles clearly delineated to avoid duplication with other extension services.

Recommendation 20

- 8.78 **The Committee recommends that the Australian Government review the effectiveness of the *National Landcare Program's* state and regional**

106 The Hon. Dr David Kemp MP (Australian Government Minister for the Environment and Heritage), *A Sustainability Strategy for the Australian Continent: Environment Budget Statement 2004-05*, p. 28, viewed 12 May 2004, <www.budget.gov.au/2004-05/ministerial/download/environment.pdf>.

107 *ibid.*

108 *ibid.*

natural resource management facilitators, with a particular focus on ensuring that:

- (a) their roles and responsibilities are delineated clearly to avoid duplication with other extension services and are consistent with other national programs designed to address salinity issues; and**
- (b) they receive the training and access to current information, necessary to perform their duties.**

The National Action Plan and the Natural Heritage Trust

- 8.79 The Australian Government recognises that NRM facilitators and coordinators are vital to achieving successful outcomes from regional investments under the NAP and the *Natural Heritage Trust* (NHT).¹⁰⁹ Community capacity building is a central element of the NAP model.¹¹⁰ Facilitators have been employed to support community and stakeholder engagement in the development and implementation of the catchment blueprints. Facilitators will address NRM issues at national/state and regional/local levels. Facilitators employed to date include:
- at a local level, approximately 650 facilitators funded under the NAP and NHT;
 - at a state level, 30 Australian Government NRM Facilitators, 13 Indigenous Land Management Facilitators and eight Local Government NRM Facilitators funded directly by the NHT;
 - at a regional level, 58 Regional NRM Facilitators, jointly funded by the Australian and state governments.¹¹¹
- 8.80 ASAN submitted that the NAP ‘provides a comprehensive system for implementing the science’. However, it was argued that insufficient time

109 Australian Government response to the House of Representatives Standing Committee on Environment and Heritage’s Report on the *Inquiry into Catchment Management: Coordinating Catchment Management*, 2003, p. 21, viewed 17 March 2004, <www.aph.gov.au/house/committee/envIRON/reports.htm>.

110 For details see: DAFF, National Capacity Building Team for the National Action Plan for Salinity and Water Quality, *National Natural Resource Management Capacity Building Framework*, Canberra, 2002, viewed 22 February 2004, <www.affa.gov.au/corporate_docs/publications/word/nrm/landcare/capacity-building-framework.doc>.

111 Ms Kate Gowland (Director, Capacity Building Section, NRM Team, DAFF), *Natural Resource Management Facilitators and Coordinators*, Committee Correspondence, 23 January 2004; The Hon. Dr David Kemp MP (Australian Government Minister for the Environment and Heritage), *A Sustainability Strategy for the Australian Continent: Environment Budget Statement 2004-05*, p. 28, viewed 12 May 2004, <www.budget.gov.au/2004-05/ministerial/download/environment.pdf>.

had elapsed since the Program's commencement to review the approach.¹¹²

8.81 In contrast, the WA SRDTC advised the Committee that many of the facilitators and coordinators employed through the NAP and NHT 'do not have adequate technical skills or experience to take complicated land management issues and fit them into an industry basis'.¹¹³ It was recommended that investment in extension staff increase and that they be given:

- 'time to develop';
- stable career paths; and
- 'access to the skills so that they can provide an information brokering role between the scientists and the land managers'.¹¹⁴

8.82 The WA SRDTC also recommended:

Progressive skilling and employment of Commonwealth-funded community support officers to allow them to provide appropriate technical advice and not just administration and policy support.

8.83 Funding provided under the NAP and NHT initiatives will boost extension services nationally and represents a significant step in the regional delivery of NRM extension services. The Committee welcomes the steps taken to build community capacity and facilitate the regional delivery of NRM programs, and believes that insufficient time has elapsed to review the process.

112 ASAN, *Submission no. 39*, pp. 3, 9.

113 Dr Donald McFarlane (WA SRDTC), *Transcript of Evidence*, 12 November 2003, p. 36.

114 *ibid.*

Recommendation 21

- 8.84 **The Committee recommends that the extension services provided by the Australian Government, and participating states and territories, through the *National Action Plan for Salinity and Water Quality* and the *Natural Heritage Trust* be reviewed in due course, with a particular focus on:**
- (a) the employment conditions of extension staff;**
 - (b) the potential career pathways of extension staff; and**
 - (c) the adequacy of the training provided for extension staff to ensure their knowledge of technical, scientific and policy issues, relating to natural resource management and in particular salinity, is both current and comprehensive.**

The role of regional management bodies

*In the fight against salinity, communication is a powerful tool and the sharing of information paramount if we are to make an impact on salinity.*¹¹⁵

- 8.85 Under the regional delivery arrangements of the NAP, CMOs will increase their role in the provision of extension services.¹¹⁶ Some CMOs have submitted that they have the capacity and are well positioned to provide extension services.¹¹⁷ The Hawkesbury-Nepean Catchment Management Board (HNCMB) presented the Committee with a picture of how scientific research on salinity should be extended:

Existing scientific knowledge needs to be implemented through regional and local strategies and action plans by the responsible body using experienced extension officers. The advisory staff need to possess multi-disciplinary skills and be able to engage local communities in the development and implementation of local NRM plans. Although the roles of these staff members needs to be separated from extension agencies promoting economic outcomes (eg. agronomists, livestock advisers), the specialist NRM facilitator needs the ability to engage these staff in the development of

115 Glenelg Hopkins Catchment Management Authority, *Submission no.18*, p. 1.

116 Mr Andrew Huckel (New South Wales Farmers' Association), *Transcript of Evidence*, 29 October 2003, p. 50. Also see: Mrs Mary Howard (Hawkesbury-Nepean Catchment Management Board), *Transcript of Evidence*, 29 October 2003, p. 67.

117 Integrated Natural Resource Management Group for the South Australian Murray Darling Basin Inc., *Submission no. 23*, p. 1.

sustainable management systems that reflect community socioeconomic expectations.¹¹⁸

8.86 The Murray Catchment Management Board (MCMB) told the Committee that, once it is established as a Catchment Management Authority, 'implementation officers' will be employed with a broad knowledge of NRM issues, and they will be supported by technical salinity officers.¹¹⁹ To ensure that staff have the requisite skills and community acceptance, the MCMB told the Committee it aims to employ ex-Landcare coordinators and similarly skilled people.¹²⁰

8.87 It was put to the Committee that there are limitations in the capacity of some CMOs to understand the scientific research they are expected to extend. The MDBC stated:

Catchment management organisations with a locally appropriate rigour are an emerging enterprise as well, and they have done an excellent job in understanding the problems and also in coordinating activity at the local scale. But they are still learning to appreciate the application of science, particularly its interdisciplinary application.¹²¹

8.88 ASSSI has cautioned that the capacity problems encountered with state extension services may be repeated with the regional delivery of extension:

The development of regional bodies under the *National Action Plan for Salinity and Water Quality (NAPSWQ)* has done little to resolve this problem, particularly because many of the staff employed by regional bodies are extension officers rather than scientists. Because they are employed on short-term contracts (typically < 2 years) they are often inexperienced and must be trained in the broad range of natural resource systems (often across large geographic regions). For this reason, they are often unable to contribute much before their positions are terminated.¹²²

8.89 The Integrated Natural Resource Management Group for the South Australia Murray Darling Basin acknowledged that the:

adequacy of technical and scientific support in applying salinity management options is variable and it is recognised that there will always be a need for more knowledge and expertise ... There will

118 Hawkesbury-Nepean Catchment Management Board, *Submission no. 21*, p. 3.

119 Mr Anthony Dawson (MCMB), *Transcript of Evidence*, 30 October 2003, pp. 18-19.

120 *ibid.*, p. 19.

121 Mr Kevin Goss (MDBC), *Transcript of Evidence*, 7 November 2003, p. 42.

122 ASSSI, *Submission no. 68*, p. 2.

be an ongoing need for technical and scientific support in the region and the INIRM Group will seek to identify the support needs required and ensure that appropriate investment is sought to meet these needs.¹²³

- 8.90 The CRC PBMDs told the Committee that CMOs need support to access the information available in national and state agencies.¹²⁴ Similarly, the Murray Catchment Management Board submitted that, although it had enough scientific information to put together ‘The Murray Catchment Blueprint’, there were gaps in the processes that link new research and technologies developed outside the region.¹²⁵
- 8.91 The Fitzroy Basin Association raised concerns about the informal and ‘fragile’ nature of the links between CMOs and researchers:
- In these early days of regional bodies, much of the dissemination occurs through the development of personal relationships between the regional bodies’ science coordinator (if they have one) and researchers. This leaves that body, and resource managers, open to a gap in sourcing relevant information, should the science coordinator leave, or if insufficient funds are available to maintain the position ... In other words, this arrangement is not supported by structure or process to the degree that it could be.¹²⁶
- 8.92 National science providers and brokers, including CSIRO, LWA and the Cooperative Research Centre for Landscape Environments and Mineral Exploration (CRC LEME), noted that it is difficult for them to have a relationship with all the CMOs in Australia.¹²⁷
- 8.93 The Committee was told of a range of options to increase CMOs’ access to, and understanding of, relevant scientific research:
- MCMB recommended that ‘Salinity Knowledge Brokers’ be employed to support CMOs.¹²⁸ The brokers would be nationally linked, and their role would be to validate, synthesise and extend the latest research and technologies relating to NRM.¹²⁹ Similarly, to target salinity

123 The Integrated Natural Resource Management Group for the South Australia Murray Darling Basin, *Submission no. 23*, p. 2.

124 CRC PBMDs, *Submission no. 8*, p. 6.

125 MCMB, *Submission no. 10*, p. 10.

126 Fitzroy Basin Association, *Submission no. 48*, p. 3.

127 Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 26. Also see: Dr Mirko Stauffacher, (CSIRO), *Transcript of Evidence*, 7 November 2003, p. 88; CRC LEME, *Submission no. 64*, p. 4.

128 Murray Catchment Management Board, *Submission no. 10*, p. 3.

129 *ibid.*

management, Greening Australia recommended that a dedicated team of 10 to 15 ‘knowledge brokers’ be established.¹³⁰

- Phil Dyson and Associates suggested a national team of salinity experts could provide mobile extension services to CMOs (modelled on the NDSP’s Tools Project).¹³¹
- GRDC noted that catchment staff need a range of expert skills to understand the science behind salinity management. It was suggested that this could be achieved through ‘significant on-job or post graduate training’.¹³²
- LWA recommended ‘a first-stop shop—which all the regional bodies, any extension officers or farm consultants can go to and say, “Who is doing work on this? What is useful,” or, “I’m after a CD-ROM,” or, “I’m after a decision support tool,” or, “I need to know if anyone has done this sort of mapping that we propose to be doing. Who can I talk to?”’.¹³³ It was proposed this could be linked to the National Land and Water Resources Audit.¹³⁴
- ASSSI recommended that the Australian and state governments ‘consider setting up a group of ‘Salinity Specialists’ capable of offering advice to regional groups as required. These specialists could be supported through the current CRC PBMS or through the proposed Australian Centre for Salinity Research’.¹³⁵
- HNCMB suggested that each CMO develop a science subcommittee to provide expert advice on salinity and NRM issues.¹³⁶
- WA SRDTC urged that there needs to be a ‘focused source of information’ for CMOs and farmers ‘with linkages to the various initiatives such as NDSP and RIRFs [Rural Industry Research Funds]’.¹³⁷

130 Greening Australia, *Submission no. 79*, p. 5.

131 Phil Dyson and Associates, *Submission no. 46*, p. 2.

132 GRDC, *Submission no. 29*, p. 9.

133 Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 28.

134 Review of the National Landcare Program, DAFF, Canberra, October 2003, p. 50, viewed 19 April 2004, <www.daff.gov.au/corporate_docs/publications/pdf/nrm/landcare/nlp_review_report_final.pdf>.

135 ASSSI, *Submission no. 68*, p. 6.

136 Mrs Mary Howard (Hawkesbury-Nepean Catchment Management Board), *Transcript of Evidence*, 29 October 2003, p. 68.

137 WA SRDTC, *Submission no. 54*, p. 6.

- DAFF advocated 'strong working relationships' between research organisations and CMOs, as have been developed between CSIRO, James Cook University and the Burdekin Dry Tropics Board.¹³⁸
- Murray Irrigation recommended that support for extension providers could be improved by billeting research scientists in the offices of extension providers (as Murray Irrigation has done with CSIRO researchers).¹³⁹

8.94 The Committee is aware that the Australian Government is committed to ensuring that CMOs have the capacity to provide on-ground extension.¹⁴⁰ However, the Committee notes serious concerns about the capacity of CMOs to adequately extend salinity research and other relevant NRM information, and the ability of research agencies to communicate and assist each CMO. The Committee acknowledges the range of proposals submitted to address these issues. The mechanisms in place through the NAP and NHT go some way to ensuring that there is a coordinated, consistent national approach to the delivery of scientific information to catchment management organisations. However, the Committee believes additional support may be necessary.

138 Mr Mike Lee (DAFF), *Transcript of Evidence*, 7 November 2003, p. 55.

139 Murray Irrigation Ltd, *Submission no. 27*, p. 5.

140 COAG, *A National Action Plan for Salinity and Water Quality*, DAFF and DEH, Canberra, 2000; House of Representatives Standing Committee on Environment and Heritage, *Co-ordinating Catchment Management*, Canberra, December 2000, p. 119, viewed 17 March 2004, <www.aph.gov.au/house/committee/envIRON/reports.htm>.

Recommendation 22

- 8.95 **The Committee recommends that the Australian, state and territory governments increase their support of catchment management organisations by:**
- (a) undertaking a review to assess the effectiveness of providing groups of mobile knowledge brokers, directed to advise on national natural resource management policies and provide integrated, current and relevant scientific and technical support on salinity issues to individuals and organisations managing salinity;**
 - (b) providing funding for the operations of any such groups as are recommended to be formed;**
 - (c) enabling the secondment of such knowledge brokers from relevant research agencies, such as the *National Dryland Salinity Program*, the Cooperative Research Centre for Plant-Based Management of Dryland Salinity and the Commonwealth Scientific and Industrial Research Organisation's Land and Water Division.**

Support provided by national and collaborative research agencies

- 8.96 In addition to NAP and NHT funding, the Australian Government, in collaboration with industry, state/territory governments and other partners, funds a range of agencies and programs which undertake and commission research on salinity, and provide extension services for salinity management. Significant players include:¹⁴¹
- Research and Development Corporations (RDCs), in particular LWA and the GRDC;
 - NDSP;
 - MDBC;
 - CSIRO; and
 - CRCs.

141 For details see chapter four of this report.

- 8.97 Evidence was presented that, increasingly, research agencies have to directly extend research to land managers, or find alternative mechanisms through which to provide extension services.¹⁴²
- 8.98 As illustrated below, the Committee was told that the decrease in state extension services had resulted in research agencies directly extending their findings, and working in collaboration with industry and other stakeholders to promote their research. The Committee was told that the costs and difficulties for research and technical providers, associated with delivering their finding to end users, were likely to increase with the regional delivery of NRM services.¹⁴³
- 8.99 Dr Tom Hatton told the Committee that in Western Australia extension was being undertaken by scientists, as they worked in collaboration with industry groups, CMOs and farmers on research projects; not 'second hand' via state extension officers.¹⁴⁴ Although costly, the process ensures the needs of end users are fed into research priorities. However, CSIRO also told the Committee that it was difficult to have links with all the CMOs:
- The shift to regional NRM management has presented a number of difficulties for Commonwealth and state technical providers who continue to support NRM science:
- The sheer number of NRM groups has meant high transaction costs in communication;
 - There is potential for creating confusion for the NRM groups if approached by several research providers;
 - There is a need to convince NRM groups to invest in technical information;
 - It is not clear who is providing the balance between emerging technologies and existing technologies and whether they have the capacity to make those decisions;
 - Getting the coordination between groups to support strategic research.¹⁴⁵
- 8.100 Furthermore, CSIRO concluded that the de-skilling of state agencies and the reduction of state extension services has led to a situation where

142 Dr Mirko Stauffacher, (CSIRO), *Transcript of Evidence*, 7 November 2003, p. 88. Also see: CRC LEME, *Submission no. 64*, p. 4; Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 26.

143 CSIRO, *Submission no. 42*, p. 42.

144 Dr Thomas Hatton (WA SRDTC), *Transcript of Evidence*, 12 November 2003, p. 36.

145 CSIRO, *loc. cit.* Also see: Dr Mirko Stauffacher (CSIRO), *Transcript of Evidence*, 7 November 2003, p. 88.

information is not being adequately communicated to implementers 'in terms of the magnitude of the problem we face'.¹⁴⁶

8.101 LWA told the Committee:

it is very difficult for national agencies like ourselves, the CSIRO, BRS or whatever to have a relationship with each of the 60-odd regional bodies in Australia. We can do it through a web interface or whatever, but it is very difficult for us to have direct face-to-face relationships with 64 different agencies. The transaction costs would eat up all our budget.¹⁴⁷

8.102 LWA questioned the efficiency of having to pay research funds to state agency staff to extend the program *Land, Water and Wool* (of which *Sustainable Grazing on Saline Lands* is a major component):

It is groups of farmers doing trials on their own farms that are literally getting this one-on-one interface through the coordinators that we fund. To be fair, some of that is being done in partnership with the relevant state government agencies. We are contracting them to do the work, but the point is that we are actually spending research dollars to pay state agencies to provide extension services. From a public policy point of view, I do not believe it is the optimum allocation of resources.¹⁴⁸

Research and Development Corporations

8.103 Both the GRDC and the Cotton Research and Development Corporation (CRDC) submitted that RDCs are fundamental to national salinity initiatives as '[t]hey have links to growers who ultimately make the land use change on the ground'.¹⁴⁹ The GRDC has contributed \$5 million to the NDSP over the last five years, and committed \$11.5 million for salinity and water management projects through its own programs between 2002–08.¹⁵⁰

8.104 With regard to building the capacity of CMOs, the GRDC submitted:

given that the science of predicting and managing salinity has run well ahead of practice, perhaps it is time to shift some of the emphasis away from regional capacity building and place greater

146 Dr John Williams (CSIRO), *Transcript of Evidence*, 7 November 2003, p. 82.

147 Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 26.

148 *ibid.*, p. 25.

149 GRDC, *Submission no. 29*, p. 1. Also see: Cotton Research and Development Corporation, *Submission no. 31*, p. 1; Dr Martin Blumenthal (GRDC), *Transcript of Evidence*, 7 November 2003, p. 71.

150 *ibid.*, p. 2. The GRDC submission, at pp. 14-21, provides an extensive list of (a) salinity projects which it has been involved in, and (b) how these have been linked to land managers.

emphasis on supporting adoption. This is an area where the GRDC can offer the greatest support and advice to catchment bodies, given the Corporation's experience with grower-group networks and in the development and extension of more sustainable farming practices.

8.105 Other issues raised by the GRDC in regards to communication and extension included the need for:

- profitable salinity solutions; and
- the establishment of a freely accessible, national database of salinity management options.¹⁵¹

8.106 GRDC concluded that '[p]erhaps the simplest action the Commonwealth could take to encourage landholders to apply scientifically proven salinity management options would be to pay landholders directly or via the tax systems'.¹⁵²

The National Dryland Salinity Program: principal communicators

8.107 Submitters widely recognised the NDSP as the principal, national communicator of information on dryland salinity.¹⁵³ Through its Communication Team, the NDSP has worked to bridge the 'communication gap' between salinity researchers and implementers at a national, state and regional level.¹⁵⁴

8.108 The NDSP submitted that it aspires to be 'Australia's lead knowledge broker of R&D and extension efforts to combat dryland salinity'.¹⁵⁵ During 2003–04, the NDSP will undertake an 'Enhanced Communication Year' in which research conducted over the past decade will be synthesised and communicated. With support from the CRC PBMDs, the NDSP aims to promote 'practical, "best-bet" and integrated systems to manage the salinity risk'.¹⁵⁶ The target audience will be farmers, communities and governments. To get its message into the public domain, the NDSP has created communication networks with CMOs, all levels of government,

151 *ibid.*, pp. 1-2.

152 *ibid.*, p. 12.

153 For example see ASSSI, *Submission no. 68*, p. 5; WA SRDTC, *Submission no. 54*, p. 5.

154 NDSP, *Submission no. 35*, p. 25. Also see: NDSP, *Exhibit no. 27, Appendix C: NDSP Communication Report 2000-03*.

155 *ibid.*, p. 19.

156 *Focus on Salt: The Newsletter of Australia's National Dryland Salinity Program*, Issue no. 28, October 2003, pp. 8-9, viewed 4 February 2004, <www.ndsp.gov.au/15_publications/20_focus_on_salt/focus_28/focus_028.htm>

implementers such as Landcare groups and contractors, industry and research organisations.¹⁵⁷ DAFF and DEH submitted that:

The NDSP provides a major communication network for disseminating salinity science and information in Australia.

Over the past nine years of operation the NDSP has helped to raise awareness of salinity through regular newsletters and media articles (such as the “Silent Flood” series screened on ABC television), supported research and development into the causes of salinity, and along with others, supports regular national forums to share information and insights into salinity and means for its management. The substantial salinity science and information resource products of the NDSP are maintained and made accessible through its web site at www.ndsp.gov.au.¹⁵⁸

8.109 Examples of the communication tools and products produced by the NDSP include a *Focus on Salt* newsletter and *SALT* magazine. In 2002–03, *SALT* magazine was distributed to 65 000 primary producers and *Focus on Salt* was distributed to approximately 5 000 catchment managers, researchers and agency personnel.¹⁵⁹ The NDSP also facilitates ‘Saltlist’, an email forum for those with an interest in salinity research and management issues.

8.110 In addition, the NDSP employs knowledge brokers (either consultants or staff from state agencies) to work directly with communities:

They do work with the communities to explore what their issues are, listen to them and provide them with feedback as to what the National Dryland Salinity Program has to offer them as well as what other researchers have to offer them.¹⁶⁰

The NDSP’s ‘Tools’ for the improved management of dryland salinity project

8.111 The Tools Project, managed by the NDSP, was presented to the Committee as a successful example of the extension of scientific research on dryland salinity.¹⁶¹ The aim of the Tools Project was to make sure that the

157 *Focus on Salt: The Newsletter of Australia’s National Dryland Salinity Program*, Issue no. 28, October 2003, pp. 8-9, viewed 4 February 2004, <www.ndsp.gov.au/15_publications/20_focus_on_salt/focus_28/focus_028.htm>.

158 DAFF and DEH, *Submission no. 72*, p. 12.

159 LWA, *Exhibit no. 127, Land and Water Annual Report 2002-03*, p. 39.

160 Dr Richard Price (NDSP), *Transcript of Evidence*, 3 November 2003, p. 10.

161 The project was supported by a range of partners including the MDBC, the Cooperative Research Centres, DEH, National Land and Water Resources Audit Program, Research and Development Corporations, and state land and water management agencies’ research and development programs throughout Australia.

knowledge acquired from research programs was distilled, interpreted and made available to the CMOs of the Murray-Darling Basin for incorporation into local salinity planning activities.¹⁶²

- 8.112 Mr Phil Dyson, a community consultant during the project, told the Committee that:

the Tools project provided us with the vehicle to put information together and to take that information out to the regional communities, and the catchment classification process allowed us to go to each of those regions and to talk about what they could do. More than that, we actually used a workshopping process over a three to five day period to break those catchments up into their component parts, using the local people's knowledge. That is the key to a lot of what we are trying to do, I think—to take the national research out into the regions where it has some relevance and then use the catchment planning tool and that understanding to take that down to the community level.¹⁶³

- 8.113 According to CSIRO it was a 'very neat process' but expensive: 'As you can imagine, you have to have the resources to be able to do it. That was, I would say, a too rare one-off.'¹⁶⁴

The future of the NDSP

- 8.114 As discussed in chapter five, the Committee notes that the forecast cessation of the NDSP was lamented by many submitters, and its continuation was widely supported.¹⁶⁵ Webbnat Land Resource Services submitted that:

The current communication thrust by the NDSP is an excellent example of the sorts of packaging, and delivery of information to the various industry, regional, technical and local government groups managing dryland salinity nationally ... If the NDSP does not continue in its current form, there is likely to be a serious impact on information transfer across the main stakeholder clients.

162 Dr Mirko Stauffacker (CSIRO), *Transcript of Evidence*, 7 November 2003, p. 89. Also see: Mr Philip Dyson (Phil Dyson and Associates Pty Ltd), *Transcript of Evidence*, 31 October 2003, p. 3; Mr Sydney Clarke, *Transcript of Evidence*, 30 October 2003, p. 6.

163 Mr Philip Dyson (Phil Dyson and Associates Pty Ltd), *Transcript of Evidence*, 31 October 2003, p. 3. Also see: Mr Sydney Clarke, *Transcript of Evidence*, 30 October 2003, p. 6.

164 Dr Mirko Stauffacker (CSIRO), *Transcript of Evidence*, *ibid.*

165 See for example: CSIRO, *Submission no. 42*, p. 4; CRC PBMDs, *Submission no. 8*, p. 1; South Australian Government, *Submission no. 81*, p. 4.

State programs have not filled this role, and no other program seems likely to pick it up.¹⁶⁶

- 8.115 The Committee believes that there is an ongoing role for the NDSP, and in particular the Communications Team, in the distillation and communication of salinity research. The Committee has recommended the retention and expansion of the NDSP.¹⁶⁷
- 8.116 However, in the event the NDSP is discontinued, it has been suggested that the Australian Government fund an alternative organisation to provide its research and extension functions. Proposals for successor organisations are discussed in chapter five.¹⁶⁸

Cooperative Research Centres

- 8.117 The Department of Education, Science and Training (DEST) submitted that: '[t]he transfer of research results to the users is one of the major objectives of the [CRC] programme'.¹⁶⁹
- 8.118 To ensure research is 'available in easily interpreted formats for both the scientific and non-scientific community' the CRC for Freshwater Ecology (CRCFE) has a 'dedicated knowledge exchange program':
- The aims of knowledge exchange are 1) to distil the key findings from a range of scientific research projects, 2) to deliver them to resource managers or the community in a useable format, and 3) to provide feedback to researchers about the needs of managers and community groups. In the CRCFE, knowledge exchange activities are carried out by a team of "knowledge brokers", in conjunction with researchers.¹⁷⁰
- 8.119 CRC LEME questioned the capacity of CRCs to deliver information under the new regional arrangements to the CMOs:
- There is a capacity issue – with so many new CMAs to service, how can individual CRC and research agencies be expected to service such a diverse client base?¹⁷¹
- 8.120 CRC PBMS told the Committee that, with the decline in state extension services, it has become necessary to use alternative avenues to extend

166 Webbnnet Land Resources Services, *Submission no. 40*, p. 3.

167 See chapter five of this report.

168 CRC PBMS, *Submission no. 8*, p. 1. Also see: Australian Society of Soil Science Inc., *Submission no. 68*, pp. 5-6.

169 DEST, *Submission no. 69*, p. 2.

170 Cooperative Research Centre for Freshwater Ecology, *Submission no. 26*, p. 3.

171 CRC LEME, *Submission no. 64*, p. 4.

research information.¹⁷² Both Landmark and CRC PBMDs advocated that their partnership represented a useful model for linking the science base for salinity management to land managers.¹⁷³ With access to over 100 000 farmers, 430 service locations throughout Australia and 250 agronomists on staff, Landmark submitted that they have become ‘a vital partner in the extension and commercialisation of the CRC’s research outcome’.¹⁷⁴ Currently, CRC PBMDs and Landmark, in conjunction with state government agricultural agencies and other CRCs, are undertaking a two part education program on dryland salinity and its management through the use of lucerne.¹⁷⁵ To date, over 450 farmers, Landmark staff and government agency staff have participated.

8.121 As a result of its successful partnership with Landmark, CRC PBMDs has recommended:

That the Commonwealth put in place strategies to encourage strategic partnerships between agribusiness, State agencies and CMAs to enhance face-to-face extension of the results of research. This CRC has a partnership with Landmark, which may serve as a model.¹⁷⁶

Direct extension by research scientists

8.122 Research scientists involved in salinity research are increasingly called upon to extend their findings to land managers. The Australian Research Council (ARC) explicitly encourages research scientists to extend their findings. In this regard, DEST informed the Committee that:

ARC programmes emphasise, where appropriate, the need for collaboration between researchers and, in the case of ARC Linkage, require interaction with the actual or potential users of the research results.¹⁷⁷

8.123 The Centre for Salinity Assessment and Management (CSAM) at the University of Sydney aims to extend information on salinity and its management to a broad spectrum of the community: from school children to landholders to industry.¹⁷⁸ To extend its research CSAM intends:

- ‘To develop interactive programs with community groups’; and

172 Professor Philip Cocks (CRC PBMDs), *Transcript of Evidence*, 13 November 2003, p. 24.

173 Mr David Coombes (Landmark), *Transcript of Evidence*, 1 December 2003, p. 2.

174 Landmark, *Submission no. 30*, p. 2.

175 *ibid.*

176 CRC PBMDs, *Submission no. 8*, p. 1.

177 DEST, *Submission no. 69*, p. 2.

178 Professor Les Copeland (CSAM), *Submission no. 19*, p. 1.

- 'To organise symposia involving government agencies, community groups and research scientists to promote salinity education, research and management'.¹⁷⁹

8.124 To encourage academic staff to undertake extension, CSAM suggested that scientists could have an extension component written into their university employment contracts, as occurs at some American universities:

Extension has never been part of the university scene in Australia ... But in the United States the evolution of the land grant system has served that community very well. There would be people who have an appointment where they do normal academic activities for 50 per cent of their time and spend the other 50 per cent of their time actually in the community with farmers.¹⁸⁰

8.125 The Committee heard from Professor James Macnae, a research scientist and recipient of ARC funds, that he had difficulty communicating the findings of his research on salinity to, and getting feedback from, land managers:

The expressed interest in salinity of a great many federal, state and catchment authorities further means that there is no obvious single point of contact for a research scientist to make any direct approach to discuss problems and possible solutions ... there is no existing linkage mechanism that allows me to communicate results of active research to those responsible for management and implementation of salinity mapping or salinity solutions. In addition, other than through the scientific literature, popular press and web searches, there is no obvious way by which problems identified by the myriad governments and agencies can be directly and rapidly communicated to the University research community.¹⁸¹

8.126 The Committee received evidence that research scientists were not necessarily the ideal people to provide NRM extension. For example, Murdoch University conceded 'that while researchers are good at research they are not necessarily the best people to be delivering that information to the community'.¹⁸² Similarly, NDSP told the Committee that:

the last people whom I want interpreting science are scientists. I would rather see science interpreted by those who are close to the

179 *ibid.*

180 Professor Les Copeland (CSAM), *Transcript of Evidence*, 29 October 2003, p. 59.

181 Professor James Macnae, *Submission no. 37*, p. 1.

182 Associate Professor Richard Bell (Murdoch University), *Transcript of Evidence*, 13 November 2003, p. 34.

ground. There has been a gap between our science speakers and our science listeners, unfortunately. So there is definitely a capacity issue that does need to be addressed and potentially within a coordinated way. We are not just dealing with the coordination of R&D but talking about potentially coordination of information dissemination.¹⁸³

8.127 LWA stated that:

To direct all the opprobrium at the researchers is a bit rich. I do not want to have to try to turn each researcher into a David Bellamy or a David Suzuki or a David Attenborough. Some of them are good at it, but most of them are better at doing the research.¹⁸⁴

8.128 WA SRDTC acknowledged that the direct engagement of scientists in extension was not necessarily the best use of resources, as Dr Tom Hatton stated: '[y]ou would probably get best value out of scientists if they were just doing science and somebody else was left to take it out to the community'.¹⁸⁵

8.129 Apart from the issue of communicating the science, submitters noted a mismatch between the needs of end users and the aims of scientists. For example, Dr John Ive submitted that scientific research tended to be narrowly focussed on a single theme or issue. This results from the delineation of scientific disciplines and an emphasis on scientific specialisation: 'this need for scientists to specialise is at odds with the needs of the landholder or manager who has to manager [sic] for a multitude of themes simultaneously'.¹⁸⁶ Indeed, Cullen et. al. have posited that land managers do not want the results of individual projects, rather they require 'concise overviews of the current understanding of a particular area'.¹⁸⁷

8.130 The Committee concludes that involving scientists in the direct extension of their research findings has the dual function of ensuring (a) findings are correctly interpreted; and (b) the priorities of land managers are relayed back to researchers. The Committee supports efforts, where feasible, to co-locate researchers with implementers, as demonstrated by CSIRO and Murray Irrigation.

183 Dr Richard Price (LWA), *Transcript of Evidence*, 3 November 2003, p. 6.

184 Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 25.

185 Dr Thomas Hatton (WA SRDTC), *Transcript of Evidence*, 12 November 2003, p. 36.

186 Dr John Ive, *Submission no. 74*, p. 1.

187 Cullen P., Cottingham J.D., Doolan J., Edgar B., Ellis C., Fisher M., Flett D., Johnson D., Sealie L., Stocklmayer S., Vanclay F. and Whittington J., Cooperative Research Centre for Freshwater Ecology, *Knowledge Seeking Strategies of Natural Resource Professionals*, 2001, p. 13, Canberra, viewed 26 February 2004, <<http://freshwater.canberra.edu.au>>.

- 8.131 The Committee acknowledges that scientists are being increasingly relied upon to promote their research findings. The Committee is aware of conferences dealing with salinity issues; including the 'Productive Use and Rehabilitation of Saline Land (PUR\$L)' conference, the 'Salinity Solutions: Working with Science and Society' conference (sponsored by the CRC PBMDs, GRDC, NDSP and others), and the inaugural 'Engineering Salinity Solutions' conference to be held in November 2004.¹⁸⁸ The Committee sees merit in the establishment of an annual national forum to promote salinity education, research and management particularly in relation to the NAP, involving government agencies, land managers and research scientists.
- 8.132 The option of including an extension component in the contracts of research scientists is worthy of consideration; however, the Committee believes that the provision of extension should not be at the expense of research activities. Indeed, the Committee acknowledges that the direct extension of research by scientists may not be the best allocation of resources, nor facilitate the dissemination of the information required by land managers.

Recommendation 23

- 8.133 **The Committee recommends that the Australian Government support the establishment of a national annual forum on salinity policy, research and management, associated with the *National Action Plan for Salinity and Water Quality*, for government agency staff, catchment management organisations, private consultants, farmers, and other land managers.**

Private sector involvement in the provision of extension services

- 8.134 The agricultural industry and NRM consultants have submitted that they are well positioned and have the capacity to increase their role in the provision of extension services. This shift was viewed as inevitable and necessary by many research organisations and government agencies.¹⁸⁹

188 Mr Bruce Munday (Saltlist), email, 25 February 2004, <Bruce@clearconnections.com.au>; Salinity Solutions: Working with Science and Society, Bendigo, viewed 13 May 2004, <www.cdesign.com.au/salinity2004/>.

189 Dr Michael Curll (Government of New South Wales, Department of Agriculture), *Transcript of Evidence*, 29 October 2003, p. 89. Also see: Mr Kevin Goss (MDBC), *Transcript of Evidence*, 7 November 2003, p. 41.

- 8.135 With regard to agribusinesses involvement in extension, Natural Resource Intelligence (NRI) told the Committee that ‘[o]ver the last 20 years, the agriculture industry has developed a very good technical service provision’.¹⁹⁰
- 8.136 As previously discussed, the Committee heard evidence about successful partnership arrangements whereby industry groups are delivering research findings to land managers, such as CRC PBMDs and Landmark, and CSIRO and Murray Irrigation.¹⁹¹ The advantages claimed for involving agribusinesses in extension were that they:
- have the capacity to have a face-to-face relationship with every farmer in Australia;
 - can provide integrated information which factors in social and economic constraints;
 - provide a mechanism for industry concerns to be fed back to scientists;
 - emphasise providing practical solutions to salinity;
 - reduce the drain on public funds (particularly in light of the perception that salinity and NRM projects can lead to private gain for land managers); and, in addition
 - reduce the need for individual land managers to pay for services.¹⁹²
- 8.137 The Committee heard that consulting companies providing NRM services on a fee-for-service basis tended to be hired with public funds, and not by individual landholders.¹⁹³ According to SKM, consulting rates range between \$50 and \$100 an hour, making extension provision a very expensive, but necessary, undertaking:
- Spending \$50,000 or \$100,000 on a project just talking to people does not seem to be delivering outcomes—whereas, in fact, we would suggest that is probably the best way to deliver outcomes in many cases.¹⁹⁴

190 Dr Brian Tunstall (NRI), *Transcript of Evidence*, 7 November 2003, p. 3.

191 CRC PBMDs, *Submission no. 8*, p. 1. Mr Alex Marshall (Murray Irrigation Ltd), *Transcript of Evidence*, 31 October 2003, p. 16.

192 ASAN, *Submission no. 39*, p. 7. Also see: Mr Kevin Goss (MDBC), *Transcript of Evidence*, 7 November 2003, p. 41; Mr Alex Marshall (Murray Irrigation Ltd), *Transcript of Evidence*, 31 October 2003, p. 15; Orbtex Pty Ltd, *Submission no. 3*, p. 13.

193 Mr Greg Hoxley (SKM), *Transcript of Evidence*, 31 October 2003, p. 37. Also see: Mr Kevin Goss (MDBC), *Transcript of Evidence*, 7 November 2003, p. 41.

194 *ibid.*

- 8.138 To promote industry involvement in the implementation of salinity management and extension, NRI recommended a range of policy and administrative changes which include:
- Providing opportunities for industry to compete for public research funds.
 - Ensuring industry can compete effectively with publicly funded organisations (full application of policy and legislation such as the Trade Practices Act and Competitive Neutrality legislation).
 - Preventing those specifying requirements from bidding for the work (full accountability and transparency).
 - Ensuring all reviews of proposals are signed and made available to the proponent.¹⁹⁵
- 8.139 Orbtek made two recommendations to foster the involvement of private enterprise in R&D and extension:
- Increase the funding opportunities for private companies that provide R&D, innovation and delivery support services in sustainability that support both national and regional initiatives.
 - Require all public science initiatives on sustainability to be undertaken collaboratively with industry (including specific knowledge companies) and local governments.¹⁹⁶
- 8.140 While the benefits of private sector involvement in extension were acknowledged, concerns were raised regarding the quality and objectivity of the advice on offer, and whether issues such as resource sustainability and conservation were adequately incorporated in advice.¹⁹⁷
- 8.141 The MDBC noted that there was a need to ensure that the qualifications and skills of consultants were adequate:¹⁹⁸
- Whilst there are some really excellent people, there are also some snake oil salesmen. A coordinating role that could be assisted would be to try and get some sort of quality assurance process into that.¹⁹⁹
- 8.142 To ensure that consultants were able to offer best practice salinity management options to land managers, SKM and the New South Wales Farmers' Association supported the formal accreditation of salinity

195 NRI, *Submission no. 32*, p. 12.

196 Orbtek Pty Ltd, *Submission no. 3*, p. 14.

197 See for example: Mr Robert Newman (MDBC), *Transcript of Evidence*, 7 November 2003, p. 41; Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 26.

198 Mr Robert Newman (MDBC), *Transcript of Evidence*, 7 November 2003, p. 41.

199 *ibid.*

advisors.²⁰⁰ AIAST submitted that its advisors undertake an internal accreditation course which requires they complete 50 hours of relevant training per year.²⁰¹

- 8.143 LWA noted that there were limits on the extent to which private sector agronomists should be relied upon to extend information on public good issues, such as salinity management, as they are primarily driven by profit, and not environmental imperatives. LWA informed the Committee that:

Those people [agronomists with agribusinesses such as Elders], though, have a private job to do for a company that has to work for its shareholders. We can get them to take this information where it fits in with their business. We cannot turn them into catchment planners.²⁰²

- 8.144 The New South Wales Farmers' Association told the Committee that it was unclear if industry involvement was the panacea to problems in extension: 'I see those cost recovery principles going against the idea of having consistent, steady, reliable, long-term extension and research programs'.²⁰³

- 8.145 The Committee acknowledges that there is an important 'public good' aspect to the extension of salinity research which may not be profitable. In addition, it is conceded that governments and government agencies, not industry, are predominantly best positioned to make integrated policy decisions about environmental issues affecting broad landscapes. However, despite these caveats, the Committee concludes that there are many advantages to increasing the involvement of agribusinesses and private consulting companies in the extension of salinity research, particularly in collaboration with public organisations involved in funding and undertaking salinity research. The Committee supports measures to foster private industry involvement in technical and support services for environmental management. In addition, the Committee recommends the formal accreditation of private sector salinity advisers, to ensure salinity advice and implementation services meet best practice standards.

200 SKM, *Submission no. 28*, p. 6. Also see: Mr Jonathan Streat (New South Wales Farmers' Association), *Transcript of Evidence*, 29 October 2003, p. 52.

201 AIAST, *Submission no. 76*, p. 5.

202 Mr Andrew Campbell (LWA), *Transcript of Evidence*, 7 November 2003, p. 26.

203 Mr Jonathan Streat (New South Wales Farmers' Association), *Transcript of Evidence*, *ibid.*

Recommendation 24**8.146 The Committee recommends the Australian Government:**

- (a) examine and remove any impediments to the further development of an industry in technical and support services for environmental management; and**
- (b) establish and coordinate, with the cooperation of the states and territories, a national accreditation process for private sector salinity advisors to ensure that salinity advice and implementation services meet best practice standards.**

The contributions of local governments

8.147 The Council of Australian Governments (COAG) has noted the importance of local government involvement in regional planning processes.²⁰⁴ In particular, as recognised by the NAP arrangements, local governments are important conduits for delivering information on salinity management options at the local level.²⁰⁵

8.148 ASAN submitted that despite being important players in salinity management, local governments were often not supported by other tiers of government:

This sector has potentially one of the greatest mechanisms to influence change on the land through its planning instruments at the local scale required. Often councils lack the funds and are not briefed sufficiently on matters of salinity within their jurisdiction. This issue needs to be addressed. Local government perhaps is a more effective instrument of bringing about change than Catchment Management Authorities.²⁰⁶

8.149 Similarly, Orbtek recommended that local governments, in collaboration with industry, need to be funded to undertake regional NRM planning and implementation:

Restore the integrity of regional and local governance in sustainability by directly funding consortia of local governments

204 Government response to the House of Representatives Standing Committee on Environment and Heritage's Report on the *Inquiry into Catchment Management: Coordinating Catchment Management*, 2003, p. 17, viewed 17 March 2004, <www.aph.gov.au/house/committee/enviro/reports.htm>.

205 DAFF and DEH, *Exhibit no. 64, Overview of the NAP, NHT and NLP*, p. 27.

206 ASAN, *Submission no. 39*, pp. 9-10.

and industry bodies to lead regional (or economic zone) activities in sustainability planning, decision support, monitoring and reporting.²⁰⁷

8.150 The Western Sydney Regional Organisation of Councils (WSROC) advised that information on the science of salinity was not flowing through to councils and as a result only half the councils in the Western Sydney area were actively engaged in the management of salinity:

There may be research happening and, if there is, that is great, but local government is not aware of it ... There is a feeling out there that we would really love some more information about this so that we can make some concrete decisions about what we are going to do in managing and developing this area, because it is going to affect our councils and our ratepayers.²⁰⁸

8.151 To support local councils, the New South Wales Government (through DIPNR) has produced a number of booklets covering the following themes:

- 'Indicators of Urban Salinity', which contains photographs of a range of salinity indicators and explains what might be the cause of salinity;
- 'Broad Scale Resources for Urban Salinity', which discusses some of the resources available to determine if salinity is, or is likely to be, an issue in a particular region;
- 'Site Investigations for Urban Salinity', which provides a methodology for assessing the impact of salinity on a proposed urban development and the impact that development may have on water and salt processes;
- 'Roads and Salinity', which reviews how salt and water processes can affect road structure and decrease lifespan, and strategies to prevent or minimise salinity damage to roads; and
- 'Building in a Saline Environment', which presents ideas on how to build structures less susceptible to salt damage.²⁰⁹

8.152 Currently the Murray Darling Association is conducting an investigation into the level of local government involvement in dryland salinity management.²¹⁰

207 Orbtex Pty Ltd, *Submission no. 3*, p. 14.

208 Mr Colin Kandan-Smith (Western Sydney Regional Organisation of Councils), *Transcript of Evidence*, 29 October 2003, p. 23.

209 Hawkesbury-Nepean Catchment Management Board, *Exhibit no. 42, Salinity Potential in Western Sydney*.

210 Murray Darling Association Inc., *Submission no. 14*, p. 1.

- 8.153 The Wagga Wagga City Council has taken a lead role in extending information on urban salinity to residents.²¹¹ During the course of the inquiry the Committee undertook an urban salinity tour with the Wagga Wagga City Council. The Council has employed staff to explain and translate 'salinity science' to the residents of the Wagga region. The types of activities undertaken by the Council include:
- issuing media releases on salinity management;
 - mounting 'Salt Expos' at events like the annual Leisure and Garden Show;
 - funding staff to present at salinity conferences around Australia;
 - making publications about salinity freely available;
 - conducting 'Urban Salinity Tours' for interested groups;
 - liaising with the Local Government Salinity Initiative team;
 - supporting Landcare Groups in their salinity management projects; and
 - making salinity information available on a website.²¹²
- 8.154 The Committee recognises that local governments have an important role to play in the transfer and dissemination of information on salinity, in particular with regard to urban salinity.

Conclusions

- 8.155 The Committee believes that effective extension officers can act as conduits between scientists and implementers: collecting, interpreting, filtering, translating and promoting scientific and technical information. However, it is conceded that extension services can only be effective with the development and promotion of economically viable salinity management options.
- 8.156 The Committee concludes that the adequacy of extension services, providing technical and scientific support for salinity management and NRM issues more generally, to land managers is 'variable across the nation'.²¹³ The withdrawal and de-skilling of state/territory extension

211 Mr Colin Kandan-Smith (Western Sydney Regional Organisation of Councils), *Transcript of Evidence, ibid.*

212 Wagga Wagga City Council, *Submission no. 5*, p. 2.

213 CSIRO, *Submission no. 42*, pp. 2, 14. Also see: Integrated National Resource Management Group for the South Australian Murray Darling Basin Inc., *Submission no. 23*, p. 2.

services continues to be a matter of concern. However, the Committee notes that this issue is being addressed by some states in their state salinity strategies (for example the New South Wales Salt Action Teams), and via involvement in national programs (for example the NAP facilitators). In addition, the Committee notes the contemporaneous increase in the involvement of researchers, industry groups, private consultants, and the Australian and local governments, in the provision of extension services.

- 8.157 The Committee commends governments at all levels which have entered into partnership arrangements to support the regional delivery of NRM services. However, the Committee identifies the shift and the resulting increase in CMOs' involvement in extension provision, as a major challenge for policy makers and the research community dealing with salinity management issues. The future task will be to ensure that the capacity of CMOs is sufficient to undertake their responsibilities with regard to the provision of extension services. The Committee views the increasing involvement by agribusiness and non-government extension providers as offering a promising avenue to consolidate efforts in this regard.

Gary Nairn MP
Chair
May 2004

