



The Australian Government Response to the
House of Representatives Standing Committee on Science and
Innovation May 2004 Report

***Science Overcoming Salinity: Coordinating and extending the
science to address the nation's salinity problem***

The nation's programs to combat salinity

Recommendation 1

The Committee recommends that mechanisms be developed to ensure that validated salinity research findings are considered in regional planning processes, and specifically that Australian Government agencies in cooperation with state and territory governments:

- (a) develop systems to ensure that the best science is made available to state government agencies, catchment management organisations (CMOs) and land managers on an on-going basis;*
- (b) provide CMOs and land managers with adequate support and resources to use and incorporate science into their regional plans, investment strategies and on-ground works; and*
- (c) provide guidelines for CMOs and land managers, making them aware of pertinent salinity research findings, detailing their implications for the broad types of investments that may be undertaken, and enforcing the guidelines through the accreditation process for regional plans.*

For implementation, this recommendation should be read in conjunction with recommendations 3 and 15.

Australian Government response:

The Australian Government, in conjunction with the states and territories, continues to work to improve mechanisms to ensure salinity research findings are considered in regional planning processes. Considerable attention is being given to developing systems to ensure that the best science is both available and readily accessible at all levels (Recommendation 1(a)).

There have been a number of developments since the Committee reported which are outlined below. In particular, in June 2004 the National Dryland Salinity Program, through Land and Water Australia, released three products to conclude its operation in an "Enhanced Communication Year". The products were:

1. "Dryland Salinity - On-Farm Decisions and Catchment Outcomes — a Guide for Leading Producers and Advisors";
2. "Dryland Salinity and Catchment Management – a Resource Guide and Action Manual for Catchment Managers"; and
3. "Breaking Ground – Key Findings from 10 Years of Australia's National Dryland Salinity Program" provide a valuable collation of scientific information as requested by this recommendation.

The publications provide a self-help system enabling governments, catchment management organisations and land managers access to a complete synthesis of ten years of salinity research that can be incorporated into regional plans, investment strategies and on-ground works. The three manuals are available in hardcopy and on CD-ROM. The CD-ROM provides an interactive system for access to nearly 200 research reports,

“TechNotes” fact sheets and numerous links to on-line resources, organisations and groups skilled in salinity management. These links plus and a ‘search’ facility enable users to readily find the level of detail required. Maps, posters and a glossary of terms are additional features.

Salinity science information continues to be available from the web sites of the NDSP, Cooperative Research Centre for Plant-Based Management of Dryland Salinity, Cooperative Research Centre for Landscape Environments and Mineral Exploration, Land and Water Australia and the Murray Darling Basin Commission. National coordination of salinity research is undertaken by the recently established Executive Steering Committee on Australian Salinity Information, a sub-committee of the Natural Resource Management Ministerial Council, to promote collaboration, efficiency and consistency in salinity science and salinity information.

The Australian Government has identified and funded particular projects to support the regional planning process, including recent developments:

- Salinity Mapping Methods Review (see Committee Report, 4.12). The final publication *Salinity Mapping Methods in the Australian Context* is currently being published as a book, user guide and CD and will be available in mid 2005; and
- Rapid Stream Salinity Surveys. The Australian Government has been working in partnership with community groups and state government agencies to conduct rapid stream surveys as a simple and inexpensive approach for locating salinity ‘hotspots’ in streams and rivers. Rapid stream surveys encourage community participation in salinity mapping and increase the level of community ‘ownership’ of salinity management, as well as improving participant’s knowledge of the salinity processes operating in their catchment.

Support and resources at the regional level (Recommendation 1 (b)) are provided through funding of expert technical advice and expertise through regional plans and investment strategies from a range of programs such as the National Action Plan for Salinity and Water Quality (NAP), Natural Heritage Trust and National Landcare Program. As the Committee has noted in Sections 2.15-2.23 of the Report, the process of accreditation of regional plans and investment strategies is designed to ensure that plans are based on sound science (Recommendation 1 (c)). Accreditation criteria require regional bodies to demonstrate their plans ‘cover the full range of natural resource management issues’ and ‘are underpinned by scientific analysis of natural resource conditions, problems and priorities’. Within NAP regions, regional plans are specifically required to address issues of salinity. Salinity science is incorporated into regional plans through consultation between regional bodies and key stakeholders including academic/scientific communities, environmental groups, industry and state, territory and Australian government agencies.

At a catchment scale, Land and Water Australia has signed Memorandums of Understanding with the Corangamite and Glenelg-Hopkins Catchment Management Authorities in Victoria for the provision of scientific information. The arrangement is aimed at finding ways of improving communication of good science to regions and gaining a better understanding of how to meet the research needs of catchment organisations that could then be more widely applied by others. This approach is one that the Australian Government would encourage for other catchments.

Practice varies across regions given the different stages of development of regional organisations and plans. However, the Australian Government considers that the process of accreditation of regional plans and investment strategies is the best approach to ensuring that appropriate science is incorporated in regional plans and investment strategies, supported by the kinds of activities referred to above and in response to later recommendations of this report.

The salinity science base

Recommendation 2

(a) The Committee recommends that the Australian Government, in cooperation with state agencies, conduct an audit of the totality of salinity research and development activities undertaken by all agencies and programs in which the Australian Government invests, including:

- (i) national programs that address salinity, such as the National Action Plan for Salinity and Water Quality and Natural Heritage Trust;*
- (ii) programs such as the National Dryland Salinity Program and National Land and Water Resources Audit;*
- (iii) agencies within Australian Government departments, including the Bureau of Rural Sciences;*
- (iv) Cooperative Research Centres;*
- (v) Research and Development Corporations;*
- (vi) national science agencies, including the Commonwealth Scientific and Industrial Research Organisation;*
- (vii) universities; and*
- (viii) where possible, the private sector.*

(b) The Committee further recommends that the audit:

- (i) map the state of salinity research findings and the tools currently available for salinity management;*
- (ii) identify all critical research gaps;*
- (iii) suggest directions for future salinity research and development activities; and*
- (iv) identify steps that might be taken to bring greater coherence to salinity research efforts across all Australian Government funded agencies and programs, and to improve coordination with state and regional research activities.*

Australian Government response:

A synthesis of salinity-related research and development activities was recently completed by the National Dryland Salinity Program during its "Enhanced Communication Year" (see response to Recommendation 1). The concluding chapter of "Breaking Ground – Key Findings from 10 Years of Australia's National Dryland Salinity Program", one part of the "Enhanced Communication Year" package, specifies future salinity research and development priorities to address critical research gaps identified in the report (Recommendation 2 (b)).

Emphasis is being placed now at the regional level to assist regional natural resource management groups facing salinity to identify key issues and investment priorities relevant to their particular circumstances. Regional groups are being encouraged to make use of the information and products of the National Dryland Salinity Program and the National Land and Water Resources Audit (see response to Recommendation 14).

The coordination of salinity research

Recommendation 3

The Committee recommends that the Australian Government ensure the continuation of the National Dryland Salinity Program (NDSP) as a matter of urgency, and that:

- (a) the role of the NDSP be expanded to address irrigation and urban salinity, with the Program renamed the National Salinity Program (NSP) or similar;*
- (b) the NSP be managed within Land and Water Australia (LWA);*
- (c) the NSP adopt research, coordination and communication strategies that assist the regional delivery of natural resource management programs and the requirements of the National Action Plan for Salinity and Water Quality specifically;*
- (d) the functions of the NSP have regard for those identified in this report;*
- (e) the NSP/LWA be adequately resourced to perform its functions by the Australian and state governments;*
- (f) relevant Research and Development Corporations, Cooperative Research Centres, national science agencies, universities, state agencies and the private sector be strongly encouraged to partner the NSP; and*
- (g) there be a continuing role for an Operations Committee, or equivalent, in providing independent scientific advice with that advice coming from a broad cross-section of scientific personnel from both the government and non-government sectors.*

This recommendation should be read in conjunction with recommendations 1 and 15.

Australian Government response:

The National Dryland Salinity Program has accomplished a significant task by raising awareness of salinity, identifying its causes and facilitating research and development into management tools and solutions. As identified in the Australian Government response to Recommendation 1, the National Dryland Salinity Program released a synthesis of this work at the conclusion of operations in 2004. Land and Water Australia

and the other National Dryland Salinity Program partners have decided not to continue the program.

The Australian Government recognises the importance of coordination of salinity research as identified in Recommendation 3. There is a need to build on the accomplishments of the National Dryland Salinity Program and ensure that appropriate research and development is undertaken. In this regard, several Federal, state and territory government agencies, Research and Development Corporations and the Cooperative Research Centre for Plant-based Management of Salinity, in particular, are investigating land use and management options to address salinity as one among a wide range of natural resource management issues. The response to Recommendation 9 provides a brief description of land use and management projects including 'Grain and Graze', 'Land, Water & Wool' and 'Sustainable Grazing of Saline Lands'.

The Australian Government with the states and territories, through the Natural Resource Management Ministerial Council, has recently established an Executive Steering Committee on Australian Salinity Information which is responsible for coordinating salinity information. The Steering Committee's role will provide a forum for national leadership and coordination of salinity and salinity management information and will facilitate collaboration and partnerships between data providers, coordinators and users (see response to Recommendation 13).

The adequacy of the science base, research needs and funding

Recommendation 4

The Committee recommends that the Australian Government give greater emphasis through its investments in salinity science to develop new, economically viable land and water use systems.

Australian Government response:

The Australian Government in supporting this recommendation, emphasises that it is continuing to support research into new, economically viable land and water use systems, particularly through its primary industry research and development corporations. The Australian Government also contributes significantly to the Cooperative Research Centre for Plant-based Management of Salinity and to the Cooperative Research Centre for Landscape Environments and Mineral Exploration. These groups are providing information that is relevant to region-based natural resource management and planning groups, including research in support of new, economically viable land and water use systems.

For example, the Cooperative Research Centre for Plant-based Management of Salinity is partnering with Meat and Livestock Australia and three catchment management authorities in the 'Profitable Animal Production from Perennials' pilot project. The project designs, tests and implements innovative animal production farming systems with

perennial pastures that are more profitable than alternative land use systems, while at the same time markedly reducing recharge and salinity. The project used bio-economic and hydrological modelling together with a series of farmer workshops to determine on-ground experimentation and demonstration. The new animal production systems are currently being tested in south west Victoria, the south coast of Western Australia and the Murrumbidgee catchment in New South Wales.

The Cooperative Research Centre for Landscape Environments and Mineral Exploration project, 'WA paleochannels for salinity mitigation', is demonstrating the use, cost effectiveness and practicality of geophysical methods to define the location and geometry of buried valleys, referred to as paleochannels. Paleochannels are important for siting production bores designed to lower the saline watertable below valuable agricultural land, providing an opportunity to improve soil health and productivity. The next stage of the project is to pump test and evaluate prospects for groundwater pumping and disposal.

The Sustainable Industry Initiative component of the National Landcare Program is working with industry groups in Western Australia including: the Grower Group Alliance, Saltland Pasture Association and the Western Australian No-Tillage Farmers Association to encourage improved natural resource management linked to profitable agriculture. In addition the Joint Venture Agroforestry Program, managed by the Rural Industries Research and Development Corporation, is also advancing new economically viable land and water use systems (see Committee Report, 4.46).

Recommendation 5

The Committee recommends that the Australian Government encourage catchment management organisations to introduce industry development planning into their natural resource management planning and funding prioritisation process.

Australian Government response:

The Australian Government supports this recommendation and will continue to emphasise the benefits of industry-based solutions to catchment management organisations and encourage complementary actions as appropriate. Encouragement for industry/catchment management organisation collaboration in planning and funding prioritisation is given through the National Landcare Program, Natural Heritage Trust, National Action Plan for Salinity and Water Quality and the primary industry research and development corporations.

The Sustainable Industry Initiative component of the National Landcare Program has established partnerships with major resource-based industries to encourage nationally consistent approaches to sustainable natural resource management, with particular reference to regional planning and incorporation into normal business operations. The partnerships have a key focus on linking business and industry priorities with regional planning and implementation processes.

For example, the Dairying for Tomorrow partnership between the Australian Government and Dairy Australia encourages continuous improvement in management practices and offers a way for industry to contribute to achieving regional natural resource management goals. The partnership includes:

- Dairy Self Assessment Tool. This tool assists dairy farmers to assess priority NRM issues on their farm, including salinity, to consider management responses and monitor their adoption;
- Property Management Planning for Dairy Farmers. This project supports nationally coordinated approaches to property management planning;
- Developing Industry Targets. This project is developing guidelines for how industry may best set and monitor management practice targets at the local community level;
- Facilitation and Industry/Catchment Collaboration. This project provides assistance to each dairy region to share information about NRM issues and collaborate in the development of targets, strategies, projects and plans.

The Committee has identified a range of commercial or potentially commercial activities which would also produce environmental or natural resource management benefits, such as oil mallee (see Committee Report, 6.59). Oil mallee projects in particular have received considerable funding from the Natural Heritage Trust over a long period of time. Regional organisations are encouraged to examine such industry development options in preparing regional plans and investment strategies.

Recommendation 6

The Committee recommends that the Australian Government emphasise, through its investments in salinity science, the development of technologies to address urban salinity, including:

- (a) salinity assessment and risk evaluation methods; and*
- (b) options for treatment and management.*

Australian Government response:

The Australian Government, in supporting this recommendation, emphasises that measures to address urban salinity are within the scope of existing support for salinity. For example, urban salinity is a focus of the CSIRO's National Research Flagship Water for a Healthy Country Flagship, a national research program focusing on water, its uses and values. CSIRO, through its work with the NSW Department of Infrastructure, Planning and Natural Resources, is developing a ground assessment and classification methodology for urban development.

The Australian Government, through CSIRO, the Cooperative Research Centre for Landscape Environments and Mineral Exploration and partial funding under the National Action Plan for Salinity and Water Quality, is involved in the Rural Towns – Liquid Assets project in Western Australia, an extension of the WA Rural Towns Program (see Committee Report, 6.68). The Rural Towns – Liquid Assets project moves beyond

salinity management to assessing new water resources and industry development in 16 towns affected by townsite salinity in Western Australia. The project focuses on developing new water supplies that will provide a resource for water-based industries and employment, using potential economic benefit as a motivator to control the salinity problem. Water management plans for each town will take them to the threshold of implementation, including salinity and waterlogging control measures; economic analysis of groundwater treatment and disposal options; and evaluation of water use options.

Recommendation 7

The Committee recommends that the Australian Government:

(a) foster greater cooperation amongst scientists addressing salinity and, specifically, sponsor an annual multidisciplinary salinity conference, research showcase or science roundtable; and

(b) examine ways to foster interdisciplinary research in natural resource management more generally.

Australian Government response:

The Australian Government supports this recommendation and will continue to support the existing initiatives that meet this recommendation. The Executive Steering Committee for Australian Salinity Information has been established to provide a forum for national leadership and coordination of salinity and salinity management information, data and knowledge (see response to Recommendation 13). The value of targeted forums and workshops for sharing information and encouraging cooperation amongst scientists is recognised.

The Australian Government supports the Productive Use and Rehabilitation of Saline Lands group to promote use of saltland for profitable industries in agriculture, forestry, horticulture, aquaculture, minerals and energy. Its membership includes representatives from all Australian States, several industry groups, CSIRO, Rural Industry research and development corporations, and private enterprise, including farmers.

The Productive Use and Rehabilitation of Saline Lands group operates through convened conferences which have been held in widespread localities covering major regions of salinity in Australia since 1990. The 2003 conference was held in the Fitzroy Basin of sub-tropical Queensland and carried the theme 'Salinity under the Sun – investing in the prevention and rehabilitation of saline lands in Australia'. The conference showcased the investment behind the science, including the planning, policies, and community partnerships behind preventing and rehabilitating the effects of dryland salinity. The next conference is to be held in New South Wales in 2005.

Other recent conferences include the Cooperative Research Centre for Plant-based Management of Dryland Salinity "Salinity Solutions Working with Science and Society" held in Bendigo, Victoria, 2 - 5 August 2004, the National Action Plan for Salinity and

Water Quality Mildura Roundtable and the Australian Institution of Engineers First National Salinity Engineering Conference held in Perth 9 - 11 November 2004.

The Basin Salinity Modelling Forum, established by the Murray Darling Basin Commission, also provides an opportunity for cooperation among scientists and policy makers. The forum has three key objectives: to explore what salinity modelling techniques are currently being undertaken; to establish more scientifically sound models; and review whether models are effective in providing useful output. The Forum is currently investigating the possibility of meeting with catchment management organisations and natural resource management (NRM) organisations to discuss appropriate modelling technologies.

The Australian Government considers that this recommendation is being substantially addressed.

Recommendation 8

- (a) The Committee recommends that the Australian and state governments make provision within the National Action Plan for Salinity and Water Quality (NAPSWQ) for the establishment of a salinity research and development fund, to finance research that:*
- (i) is of national or statewide significance, and beyond the scope of individual catchment management organisations (CMOs);*
 - (ii) pertains to the development of new technologies and industries for salinity management; and*
 - (iii) is otherwise of a long-term, strategic or generic nature.*
- (b) The Committee further recommends that the allocation of the pooled research funds:*
- (i) be as agreed between the Australian and state governments, but that CMOs be consulted for research needs; and*
 - (ii) have regard for the research priorities identified in this report.*

Australian Government response:

The National Action Plan for Salinity and Water Quality (NAP) has no separate component for research and development. The states and territories have not supported the establishment of a separate national research and development fund.

In July 2003, the then Science and Information Working Group, of the Natural Resource Management Standing Committee, developed a draft paper, *Science and Information to Support the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust*, which proposed priorities for targeted investment in science and information. In particular the paper proposed a Commonwealth/State partnership under the NAP to deliver a coordinated investment on science information and capitalise on science that is funded outside the NAP. While the Standing Committee supported the identified research priorities, it did not support allocating resources from each bilateral process into a multilateral, national program. The Standing Committee endorsed the paper as an official Position Paper of Standing Committee to give individual jurisdictions

guidance and a basis for pooling resources across jurisdictional boundaries to address common research priorities.

Considerable Australian Government funding is provided for salinity research and development outside the NAP. The Australian Government considers that existing arrangements for research and development, as described in the responses to Recommendation 1, 4 and 9, are financing salinity research at the national and state-wide levels as recommended.

Recommendation 9

The Committee recommends that the Australian Government encourage Research and Development Corporations to:

- (a) invest more substantially in research for sustainable land use systems and in the development of new salinity technologies; and*
- (b) conduct projects that forge links across commodities in farming systems.*

Australian Government response:

The Australian Government supports Recommendation 9. The Australian Government is encouraging research and development corporations to work cooperatively to develop new sustainable land use systems and new salinity technologies, including projects that forge links across commodities in farming systems. Collaboration, coordination and investment between research and development corporations was promoted in the Australian Government Department of Education, Science and Training paper *Developing National Research Priorities*, released in May 2002. Consistent with this, Senator the Hon Judith Troeth, then Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry, issued research priorities for rural research and development corporations, including giving priority to natural resource management and emphasising collaboration and cooperation.

'Land, Water & Wool', a joint program of Australian Wool Innovation, Meat and Livestock Australia and Land and Water Australia, is an example of research and development corporation cooperation. It is geared towards practical application and tapping into a decade of natural resource management research and development and building on the wool industry's own research base. The program is providing practical tools to assist wool producers to better manage their productivity, natural resources, forecasting and risk management; strategic research to assist wool industry planning and positioning for the future; networks of producers sharing natural resource management ideas and results; and opportunities for the wool industry to position itself with strategic environmental branding.

Other examples include "Grain & Graze" – a joint research and development program of the Grains RDC, Meat & Livestock Australia and Land and Water Australia (See Committee Report, 4.46); and "Sustainable Grazing of Saline Lands" – a research

subprogram of "Land, Water & Wool" undertaken by the Cooperative Research Centre for Plant-based Management of Dryland Salinity (See Committee Report, 4.46).

The responses to Recommendations 4 and 6 provide further examples of research for new sustainable land use systems and salinity technologies undertaken by the Cooperative Research Centre for Plant-based Management of Salinity and the Cooperative Research Centre for Landscape Environments and Mineral Exploration.

Recommendation 10

The Committee recommends that, in cooperation with the states, the Australian Government:

- (a) identify and remove impediments for catchment management organisations (CMOs) to undertake or commission research, and encourage CMOs to support research activity as part of their investment strategies;*
- (b) provide incentives for greater collaboration between CMOs to support research of cross-catchment benefit; and*
- (c) provide an appropriate degree of support to evaluate tenders and contracts let at the regional level.*

Australian Government response:

The main role of catchment management organisations is to plan, deliver and represent on on-ground management actions. They are not a primary provider of research funding. Catchment management organisations are expected to commission or undertake research activities only to the extent that those activities were needed to improve or develop management actions. Catchment management organisations have the opportunity to identify research activities that could contribute to their management activities as part of their regional priorities and investment strategies in the regional natural resource management plan process.

Catchment management organisations have contributed to research through partnerships with cooperative research centres, research and development corporations and other research providers. For example, the Heartlands initiative involves collaboration between Goulburn Broken Catchment Management Authority and North East Catchment Management Authority, in partnership with CSIRO, the Murray Darling Basin Commission, Natural Heritage Trust and other partners, to improve land use in the Murray-Darling Basin. The initiative combines a research program directly with the implementation of on-ground works such as establishment of perennial pastures and erosion protection measures. The Catchment Management Authorities provide support through in-kind assistance and on-ground works rather than research funding. In this way research guides on-ground works to ensure maximum environmental benefit and the close linkage with on-ground implementation ensures that research remains relevant and well focused.

Recommendation 11

The Committee recommends that the Australian Government examine ways to encourage private sector investment in research and development for commercial measures to arrest salinity and other forms of natural resource degradation.

Australian Government response:

The Australian Government agrees that commercial measures may provide important opportunities to improve natural resource management. The Australian Government provides a broad range of incentives to encourage private sector investment in salinity and natural resource management research and development.

The Cooperative Research Centre model provides a mechanism to link researchers with industry to focus research and development efforts on progress towards utilisation and commercialisation. The Cooperative Research Centre for Plant-based Management of Dryland Salinity and Cooperative Research Centre for Landscape Environments and Mineral Exploration provide the primary linkages in relation to salinity. For example, the Cooperative Research Centre for Plant-based Management of Dryland Salinity is working in partnership with AWB Landmark in the 'Promoting Salinity Solutions Through Agribusiness' project which seeks to make the latest information on the establishment and management of perennial pasture plants, as part of profitable whole-farm systems, available to farmers through a national network of local agribusiness agents (see response to Recommendation 16).

The Australian Government has contributed over \$3.45 million over three years to the Commercial Environmental Forestry Program to develop and test a forestry investment model to address salinity in priority regions across Australia. The model will improve the cost-effectiveness of regional investments in targeted re-vegetation.

Levies from Australian industries are funding salinity research and development through the Rural Industry Research and Development Corporations, as indicated in the response to Recommendation 9. The Australian Government matches industry contributions for research and development to encourage such investment.

The Australian Government provides incentive for private sector R&D investment through the *R&D Tax Concession*, which allows companies to deduct up to 125 per cent of eligible expenditure on R&D activities from assessable income when lodging their income tax return. As an added incentive, a *175 % Incremental (Premium) Tax Concession* was introduced in 2001 for companies who increase their level of R&D expenditure. Special provisions in the income tax law allow primary producers and irrigation water providers to claim an outright deduction for expenditure on landcare operations. This includes, for example, expenditure on preventing or combating land degradation, and expenditure on constructing drainage works for the purpose of controlling salinity

The regional plans and investment strategies identify key natural resource management issues and proposed responses to these for each region. The investment strategies in particular are intended to provide information on how both private and public sectors can invest in activities that are intended to arrest and ameliorate natural resource degradation in the region.

Recommendation 12

The Committee recommends that the Australian Government, in cooperation with state governments, encourage development of industry capacity in salinity research and development, by adopting measures that include:

- (a) ensuring tender specifications provide genuine opportunities for industry to compete for public research funds, particularly for small to medium sized enterprises at the regional level; and*
- (b) ensuring tendering processes are transparent, so that industry can compete effectively against publicly funded organisations.*

Australian Government response:

Australian Government, in supporting this recommendation, emphasises that the Australian Government tendering processes are consistent with best practice management and adhere to the Commonwealth Procurement Guidelines for procurement of goods and services. These are based on the key supporting principles of:

- Encouraging competition (including non-discrimination);
- Efficiency and effectiveness;
- Ethical use of resources; and
- Accountability and transparency.

The Australian Government strongly encourages regional procurement processes using Australian Government funds to be undertaken in accordance with these principles.

Regional processes operate under the requirements of their relevant State jurisdictions. The Australian Government supports the provision of services through open and transparent processes including the establishment of strategic alliances with researcher providers and community and volunteer groups.

Data management and mapping technologies

Recommendation 13

The Committee recommends that the Australian and state government agencies holding natural resource management datasets, accelerate the development of data collection, management and retrieval systems that are standardised, integrated and accessible.

Australian Government response:

Australian Government acknowledges the importance of sound data collection and management systems in the management of our natural resources. The Australian Government and state governments are addressing the thrust of this recommendation through support for the National Land and Water Resources Audit which provides data, information and nationwide assessments of Australia's natural resources, as described in the Committee Report, 4.77 to 4.85.

The Executive Steering Committee on Australian Salinity Information is a newly established body under the Natural Resource Management Ministerial Council responsible for coordinating salinity information and with close links with the Audit. The Steering Committee's role in particular is to:

- provide a forum for national leadership and coordination of salinity and salinity management information
- work towards improvements in data collection, management and sharing for the next national assessment of dryland salinity
- facilitate collaboration and partnerships between data providers, coordinators and users
- develop and implement a strategy for 2004-05 to 2005-06 to achieve the outcomes and objectives of the National Dryland Salinity Data Infrastructure Project (a project of the Australian Government's Natural Heritage Trust), including but not limited to:
 - developing agreed data protocols, guidelines and standards to enable Australia-wide, State/Territory and regional data to be assessed in a comparable way
 - facilitating provision of up-to-date regional/catchment scale data that will allow for data to be manipulated in a format that can be collated up to the national level
 - identifying significant gaps in existing data and information, with a focus on priority regions

Recommendation 14

The Committee recommends that ANZLIC – the Spatial Information Council, in collaboration with the National Land and Water Resources Audit, be resourced to support managers of regional projects to develop and implement best practice data management policies. Emphasis should be placed on developing:

- (a) consistent data collection, management and retrieval systems;*
- (b) mechanisms to encourage data sharing between catchment management organisations, research institutions, industry bodies and government agencies; and*
- (c) quality assurance processes to ensure standards are attained.*

Australian Government response:

The Australian Government agrees with Recommendation 14. The issue of building regional capacity to access and improve data management has been recognised and is being addressed as resources permit.

In 2003, a Natural Resources Information Management Toolkit project was implemented by ANZLIC and the National Land and Water Resources Audit (Audit) specifically to assist regional groups. The Toolkit was developed in cooperation with state and territory agencies.

The Toolkit provides resource materials to build the capacity at regional and local levels to manage, utilise and share natural resources data and information more effectively. It supports the development of community networks through open and efficient sharing of information resources and knowledge, and assists the establishment of information loops between regional, state and national levels.

The Toolkit acknowledges that each State and Territory has its own initiatives relating to data and information management including governance guidelines and protocols. It is recommended that users of the Toolkit establish contact with their respective jurisdiction representatives to ensure that they obtain the latest information related to data standards, collection procedures and other information related to protocols.

The Toolkit is available at <http://www.nlwra.gov.au/toolkit/default.htm>. ANZLIC and the Audit have also agreed that they will work together to develop a joint report on the status of Australia's natural resource data infrastructure and look at ways to support regional groups by building on the initiative of the Toolkit.

In relation developing better data sharing arrangements, consistent data collection, management and retrieval systems are being developed through various Executive Steering Committees relating to natural resource management issues such as vegetation, soil, salinity and water. The Steering Committees provide advice on national data management and sharing protocols to ensure national consistency, are coordinated through the Audit, and report to the Natural Resources Programs and Policy Committee, a subcommittee of the Natural Resource Management Standing Committee.

The Australian Government is also providing \$900,000 over two years for a project to build stronger links between scientists, information providers and regional communities. The project, *National Knowledge Brokering for Regional Natural Resource Management*, is being funded under the Natural Heritage Trust and is managed by Land and Water Australia. The project aims to ensure regions have the ability to access the information they need to plan, implement and evaluate their natural resource management investments and help improve the flow of knowledge to and from regions and local communities. As part of this project Land and Water Australia is working with the Audit to examine ways to improve understanding of the availability and access to natural resources data and information.

Support for implementers: extending the science

Recommendation 15

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.

Australian Government response:

The Australian Government, in supporting this recommendation, emphasises that the needs identified in Recommendation 15 are being addressed through current data management arrangements.

The National Dryland Salinity Program "Enhanced Communication Year" publications, described in the response to Recommendation 1, provide a self-help system enabling governments, catchment management organisations and land managers access to a complete synthesis of ten years of salinity research that can be incorporated into regional plans, investment strategies and on-ground works.

The response to Recommendation 13 describes how the National Land and Water Resources Audit has developed the Australian Natural Resources Atlas to provide ready access to a database of interpretive material, scientific research and natural resource data. The Atlas has a section dedicated to salinity science and management.

Salinity science information is also available from the Australian Government Natural Resource Management web site and web sites of the National Dryland Salinity Program, Cooperative Research Centre for Plant-Based Management of Dryland Salinity, Cooperative Research Centre for Landscape Environments and Mineral Exploration, Land and Water Australia and the Murray Darling Basin Commission.

Recommendation 16

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.

Australian Government response:

Face-to-face extension services for the provision of technical advice are generally the responsibility of state and territory government agencies.

For its part, the Australian Government funds an extensive network of 117 facilitators and coordinators throughout Australia that are available to assist land managers and industry groups across a range of natural resource management issues, including access to expert advice and information. In addition, the Australian Government jointly funds, with state, territory and local governments, regional organisations, industry and community groups, over 650 local and regional level facilitators and coordinators to support the move to improved natural resource management practices.

The Australian Government is encouraging private enterprise such as AWB Landmark and Combined Rural Traders to undertake a greater role in coordination and facilitation of NRM issues through their partnership with the Cooperative Research Centre for Plant-based Management of Dryland Salinity. The partnership includes a nationally accredited salinity training program to develop national competency standards in salinity, delivered in cooperation with the NSW Department of Primary Industries. To date 680 agricultural advisers across NSW, Victoria, South Australia, Queensland and Western Australia have taken part in the salinity management workshops. The Australian Government will explore using these resources in information brokering.

Recommendation 17

The Committee recommends that the Australian Government, in partnership with the relevant state 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.

Australian Government response:

The Australian Government has provided a national framework for salinity research and development through the National Dryland Salinity Program publications and other resources mentioned in the response to Recommendation 1. It is the responsibility of individual states and territories to develop manuals of variable options in each jurisdiction. This is particularly relevant given that measures to address salinity depend heavily on local conditions.

The need identified by this Recommendation is provided by the resources referred to in the response to Recommendation 1.

Recommendation 18

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.*

Australian Government response:

Extension services are the primary responsibility of states and territories as are the employment conditions, career pathways and training of staff.

Regional catchment management organisations are expected to identify their specific requirements for natural resource management extension services within their regional plans and investment strategies and to determine the service delivery methods most appropriate to their circumstances. This could include direct employment of staff with specific extension skills or acquisition of these services from an outside public or private service provider. Many states have moved to a demand driven model where the services delivered are tailored to the specific needs of the end user.

Recommendation 19

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.

Australian Government response:

Face-to face extension services for the provision of technical advice has in the past been undertaken by state and territory government agencies. More recently, there has been a move towards a demand driven approach to accessing such advice. Under the regional natural resource management model, regional organisations may employ local facilitators or coordinators through their regional investment strategies to support community engagement and on-ground activities. In addition, they may choose to purchase technical advice from service providers such as Greening Australia, Universities, Cooperative Research Centres and others and have this tailored for their specific needs.

In addition to regionally employed extension staff, a variety of additional sources of advice are now becoming available such as private providers and industry based and funded extension staff. This change is in line with the development of an industry in technical and support services for environmental management identified in Recommendation 24. The Australian Government considers that no further action is needed on this recommendation.

Recommendation 20

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

Australian Government response:

The Australian Government notes the Committee's conclusion that Landcare activities are vital to the transfer of information on salinity and its management. The roles and responsibilities of National Landcare Program state and regional landcare coordinators complement those of state, regional and local facilitators funded through the Natural Heritage Trust. All personnel are working towards similar outcomes; however the stakeholder focus differs between positions.

National Landcare Program State Landcare Coordinators work with the National Landcare Facilitator to provide strategic direction and support for the Landcare and primary industry volunteer movement within a state/territory. This includes encouraging further industry participation in sustainable natural resource management through the existing Landcare and primary industry volunteer movement. In all states, duplication of roles with other state-based natural resource management facilitators is avoided through agreement on work responsibilities and regular consultation. State Landcare Coordinators convene formally as a group every six months and have access to training as required for their individual needs.

The primary purpose of the regionally based community landcare coordinators is to support the involvement of landcare participants, including volunteer groups, primary producers and their organisations in regional and local level sustainable resource use. Specific roles are determined on a case by case basis, depending on the community's needs. In most cases, the coordinators are employed by regional organisations and duplication with other locally-based coordinators is therefore avoided. Regional organisations are also responsible for their training.

The National Landcare Program's ongoing monitoring and evaluation activities will include analysis of state and community landcare coordinators in 2006.

In respect of positions funded from the Natural Heritage Trust, Australian Government Facilitators work at a state/territory level, and have a detailed understanding of NRM policy and programs. Their role is to help governments, regional bodies and Regional

Facilitators understand the key Australian Government NRM policies, and to act as a voice back to policy makers.

Trust Regional Facilitators operate at the regional or catchment level to assist the delivery of the Natural Heritage Trust and National Action Plan for Salinity and Water Quality. Trust Local Level Facilitators/Co-ordinators work with communities and volunteer groups at the local level to carry out sustainable environmental and agricultural projects.

Overall, these arrangements are managed to avoid duplication and to provide seamless delivery of services to the range of on-ground stakeholders referred to above.

Recommendation 21

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 (NAPSWQ) and the Natural Heritage Trust (NHT) 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.*

Australian Government response:

The employment conditions, career pathways and training of extension staff are the responsibility of the individual employment agency, be it the Australian Government, state and territory governments, catchment management organisations or local council.

A review of the roles and responsibilities of the various facilitators and coordinators employed under the programs of the first phase of the Natural Heritage Trust recognised the principle that the regional planning process is the appropriate level to determine the support required to meet the needs of a particular region at the catchment and local levels.

Under the regional delivery model being applied to the delivery of funding under the Trust and the National Action Plan for Salinity and Water Quality, individual catchment management organisations have the responsibility for identifying the natural resource management priority issues for their region through a process of broad community consultation and developing a regional natural resource management plan. Under this model the relevant catchment management organisations are responsible for identifying and funding the support services necessary to implement the plan.

Members of the Australian Government national facilitator network are provided with on the job training through an annual forum and meetings on specific themes for relevant officers.

In 2003, the Australian Government commissioned a study to determine the requirement for salinity and water quality training in the Conservation and Land Management Training Package under the Vocational Education and Training accreditation system. The study found that there was a need for a new stream on salinity and water quality to generate a national strategic approach to building capacity under the National Action Plan for Salinity and Water Quality. The findings provide a useful basis for investigating structured approaches to vocational training as a contribution to developing career pathways for extension staff.

Recommendation 22

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 organizations 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.

Australian Government response:

As indicated in the response to Recommendation 21, it is the responsibility of regional catchment management organisations to identify their needs for such services and to determine the most cost effective delivery mechanism. Service providers (such as the relevant cooperative research centres, Greening Australia and CSIRO) should identify the services that they can provide and advertise these to the regional bodies.

The Australian Government will ensure that dissemination of knowledge resulting from activities that it directly funds under the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust will be an integral component of the service provision.

Knowledge brokering to support natural resource management activities was identified as an investment theme under the recent call for projects under the National Competitive Component of the Trust. This theme is also covered under some of the funded national projects, for example a Greening Australia Knowledge Exchange project covering vegetation management and a Land and Water Australia project which aims to build stronger connections between research and those undertaking natural resource management planning, implementation and evaluation activities in regions. The focus is upon having knowledge support being delivered through a range of mechanisms that

meet the service requirements of the various key interest groups for relevant and timely advice.

Support for regional catchment management organisations is also being provided through a range of state-wide investment activities funded by the National Action Plan and Trust. For example Queensland has invested in a range of state-wide projects covering agriculture, salinity, capacity building, water quality and social and economic issues.

Several evaluations at the national level are underway. These include evaluations relating to:

- salinity outcomes of regional investment;
- sustainable agricultural outcomes of regional investment.
- biodiversity outcomes of regional investment; and
- significant invasive vegetation species (weeds) outcomes of regional investment.

The purpose of the salinity evaluation is to assess the extent of regional investment in salinity and water quality activities that contribute to the goal of the National Action Plan and objectives of the Natural Heritage Trust, and to evaluate the likely effectiveness of these investments in achieving progress towards these objectives. The evaluation is examining the system for the regional delivery of these programmes and assesses the extent to which the system supports the achievement of reduced salinity and improved water quality. The expected completion date for the reviews is August/September 2005.

Recommendation 23

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.

Australian Government response:

The Australian Government supports this recommendation and considers that the resources referred to in the response to Recommendations 3 and 7, and the existing initiatives outlined in this response below, fulfil the need identified by this Recommendation.

The Australian Government supports the holding of a national forum on salinity research and development. To this end the Australian Government sponsors the Productive Use and Rehabilitation of Saline Lands group and the Executive Steering Committee on Australian Salinity Information responsible for coordinating salinity research and information extension (as described in the response to Recommendation 1). In addition, the Natural Resource Management Ministerial Council Community Forum provides a mechanism for exchange of views amongst chairs of catchment management organisations on natural resource management issues including salinity. The theme for

the meeting of the Community Forum in April 2005 was "Partnerships, Risk Management and Science".

Recommendation 24

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.*

Australian Government response:

The Australian Government agrees with Recommendation 24 in that it fully supports initiatives generating strong demand for technical and specialist services appropriate and specific to the needs of regional Australia.

In 2003, the Australian Government concluded a scoping study into the inclusion of salinity and water quality training in the Conservation and Land Management Training Package under the Vocational Education and Training accreditation system. The report recommended that a new stream on salinity and water quality be included in the Package to create a national strategic approach to building capacity under the National Action Plan for Salinity and Water Quality. The Australian Government is currently exploring the development of an operational plan to develop, promote, deliver and support the salinity and water quality education and training stream under the Conservation and Land Management Training Package.

In 2002, the Rural Industries Research and Development Corporation commissioned a report *Towards Professional Accreditation for Advisers and Consultants in Agriculture, Natural Resource Management and Related Sectors*. The report recognised the need and support for a National Accreditation Scheme for professional consultants and advisers in agriculture, natural resource management and related sectors. In particular it suggests such a scheme would need to have strong industry ownership and be coordinated by a national industry council; incorporate both a generic skills and knowledge component and an industry specific component; have rigorous standards, with a code of ethics and provision for de-accreditation; build on existing accreditation programs; be self-funding; link to other appropriate international schemes; have a distinctive and representative name and logo; and be evaluated regularly.

Industry codes of professional practice exist that encompass the provision of salinity-related services. The Australian Institution of Engineers and the Australian Institution of Mining and Metallurgy both maintain professional codes on practice and these also refer to the provision of consultancy services. Clients of such services can require proof of membership and adherence to such codes.

The Cooperative Research Centre for Plant-based Management of Dryland Salinity has developed a nationally accredited salinity training program to develop national competency standards in salinity (see response to Recommendation 16). To date over 680 private sector agricultural advisers have taken part in the salinity management workshops.

In addition, the New South Wales Southern Salinity Action Team initiated and is currently working on the development of a competency based salinity training package that will be accredited under the Australian Quality Training Framework. Accreditation will provide national recognition of the training package and link training content to units of competency.