Salinity:
A New Balance

The report of the
Salinity Taskforce established
to review salinity management
in Western Australia

September 2001

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Dr Bruce Hamilton
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The Salinity Taskforce

Dr Fionnuala Frost (Chair)
Dr Frost is a rural sociologist and currently works as a private consultant for both Government and the community and is a lecturer at the University of Western Australia and Curtin University of Technology.

Dr Bruce Hamilton
Dr Hamilton is the former CEO of the Waterways Commission and is now a private consultant. He has a depth of experience in organisational and natural resource management and is currently a board member of Greening Australia (Western Australia).

Mr Michael Lloyd
Mr Lloyd runs a farm business in Lake Grace. He was a former President of the Western Australian Farmers' Federation wool section, is the founder and inaugural chair of the Saltland Pastures Association, and has had a long and continuing involvement in the Landcare movement.

Dr David Pannell
Dr Pannell is an Associate Professor in Agriculture and Resource Economics at the University of Western Australia, and Leader, Economic and Social Assessment Program, Cooperative Research Centre for Plant-Based Management of Dryland Salinity.

From left: Dr David Pannell, Mr Michael Lloyd, Dr Fionnuala Frost and Dr Bruce Hamilton.
Photo supplied by the State Salinity Council

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Foreword to Minister

11 September 2001

Dr Judy Edwards MLA
Minister for the Environment and Heritage;
Minister with Special Responsibility for Salinity
29th Floor, Allendale Square
77 St George's Terrace
PERTH WA 6000

Dear Minister

Dryland salinity remains one of the most substantial challenges facing the Western Australian community. Recent information suggests that even with significant and immediate intervention, groundwater levels will continue to rise until well into the future, placing at risk highly valuable public assets, such as biodiversity on public and private land, rural towns, water supplies and road and rail infrastructure as well as at least four million hectares of productive agricultural land.

These projections justify continued concerted and long-term action by Government and the community to address the threat of increasing salinity and its impacts. The Taskforce considers that this further action should be informed both by an agreed Vision of the future Western Australian landscape which recognises that salinity is here to stay and by an attitude which views salinity as both a threat and an opportunity.

For the most part, the Taskforce endorses the programs and processes already in place across Government and the community to support salinity management in Western Australia. However, the Taskforce has recommended an even closer focus and greater investment on strategic activities that will achieve results. In other words, the Taskforce advocates a deliberate shift away from the broad-brush distribution of spreading funds across the landscape facilitated throughout the Decade of Landcare which, while valuable for its role in catalysing change, is unlikely to contribute significantly to managing salinity.

The salinity problem is serious and so difficult to manage that very careful consideration must be given to the application of public and private resources to its management. In particular, the Taskforce has argued for increased activity to protect public assets (such as biodiversity-rich nature reserves and infrastructure) and for the development of commercially viable options and industries to assist farmers and regional communities to more effectively manage salinity. This will mean a different approach to Government funding involving targeted public investment to promote private action and investment. It should also materially help the Government in negotiating partnerships with the Commonwealth Government. The resulting coordinated and visionary approach to jointly developing integrated solutions to salinity should bring considerable benefits to rural communities.

Apart from developing commercially viable options to manage salinity, developing the capacity of individuals and communities to respond has also been a central concern of the Taskforce. Therefore the Taskforce has argued for increased investment to develop new technologies, improve extension and build stronger institutional arrangements including the role of natural resource management regional groups.

The Salinity Taskforce has greatly appreciated the opportunity to 'take stock' of the State Government's current response to salinity in Western Australia. We appreciated the level of enthusiasm within the community to contribute to the Taskforce's deliberations. One hundred and forty one written submissions were received and public meetings were attended by some 200 people. This level of engagement clearly demonstrates the far-reaching impact of salinity on the lives and businesses of many in the Western Australian community and the genuine commitment of people to continue looking for solutions and to take action.

The Taskforce has made 94 recommendations to the Government for consideration. While the Taskforce hopes that its report and recommendations will shape salinity management in Western Australia in the coming years, the Taskforce would also urge the need for periodic review to ensure that the State is responding to new information and new opportunities as they become available.

On behalf of the Salinity Taskforce I commend our report and recommendations to you.

Yours sincerely

Dr Fionnuala Frost
Chair
Salinity Taskforce

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Acknowledgements

The Salinity Taskforce would like to acknowledge all of the people and organisations that made written submissions to the Taskforce and those people who attended the public meetings or contacted the Taskforce members individually. The Taskforce also benefited greatly from the individual briefings provided by Chief Executive Officers and senior staff from Agriculture Western Australia, Department of Conservation and Land Management, Department of Environmental Protection, Waters and Rivers Commission, Department of Local Government and Regional Development and Department of Indigenous Affairs as well as the State Salinity Council, and their contributions are acknowledged.

The Taskforce greatly appreciated the time made available by Dr Judy Edwards, MLA Minister for the Environment and Heritage and Minister with Special Responsibility for Salinity and Hon Kim Chance, MLC, Minister for Agriculture, Forestry and Fisheries, to meet with the Taskforce throughout its deliberations.

The Taskforce has also greatly appreciated the assistance and time provided by Ministerial Policy Officers, Damien Hills, John D'Agostino and Mark Chmielewski in supporting close liaison with the Ministers for Environment and Heritage and Agriculture.

The Taskforce would particularly like to thank and acknowledge the work of the South Coast Regional Initiative Planning Team, the South West Catchments Council, the Blackwood Basin Group, the Avon Working Group, the Swan Catchment Council and the Northern Agriculture Integrated Management Strategy Group who, at short notice, ably assisted the Taskforce in hosting, organising and delivering its public meetings.

The Taskforce also would like to acknowledge the hard work and dedication of Christine Wardell-Johnson who similarly stepped in at short notice to perform the role of Acting Executive Officer and who contributed much to the Taskforce's work.

Taskforce members would like to sincerely thank Michael Rowe, Executive Officer to the Salinity Taskforce, for his outstanding contribution and advice.

The Department of Agriculture provided considerable staffing resources at short notice to support the Taskforce and the Department of Conservation made available its significant publication expertise. This was much appreciated and is gratefully acknowledged.

Executive Summary

The Minister for the Environment and Heritage and Minister with Special Responsibility for Salinity, Dr Judy Edwards MLA, announced the formation of the Salinity Taskforce on 31 May 2001. The Taskforce was necessary to provide a more targeted and cohesive response to Western Australia's salinity threat and to review how salinity could be managed in the broader context of natural resources management. The Taskforce has maintained close liaison with Minister Edwards and the Hon Kim Chance MLC, Minister for Agriculture, Forestry and Fisheries.

The Taskforce has consulted widely in preparing its report and recommendations. More than 200 people attended public meetings with the Taskforce in Esperance, Jerramungup, Boyup Brook, Merredin, Three Springs and Perth. In addition, the Taskforce received 141 written submissions responding to its Terms of Reference. Finally, the Taskforce invited briefings from a range of key stakeholders, including Government departments, the State Salinity Council, Natural resource management regional groups, non-government environment organisations and a range of groups and organisations representing farmers.

The Government directed the Taskforce to respond to six Terms of Reference.

1. Review the strategies and actions of the State Salinity Action Plan and Strategy, and their implementation, paying special attention to:
   - 1.1 Community support and capacity building;
   - 1.2 Progress in assessing the feasibility of engineering options;
   - 1.3 Integration of actions across government at ministerial, agency and regional level;
   - 1.4 The potential role of industry, research and development groups in salinity management;
   - 1.5 Progress in the development of new solutions, including the level of support to development programs;
   - 1.6 The relationship to and the congruence with regional Natural Resource Management strategies;
   - 1.7 Mechanisms to encourage adoption of improvements in land management practices and to discourage continuation of inappropriate land management practices; and
   - 1.8 Mechanisms to support biodiversity protection.
2. In a strategic context, advise on the adequacy of the State's salinity program paying special attention to:
   - 2.1 Funding gaps ie. actions which are not funded in the current program; and
   - 2.2 Whether the level of response is appropriate for the scale of the problem.
3. Review the statewide structures that support a whole of government and community partnership approach to the implementation of the State Salinity Strategy and Action Plan.
4. Review the processes through which these statewide structures report and are accountable to government and the community.
5. Taking into consideration the development of the Inter-Governmental and Bilateral Agreements for the National Action Plan for Salinity and Water Quality and other national, state and regional funding programs, review the process for prioritising the future expenditure of funds to combat salinity.
6. Review existing monitoring and evaluation arrangements and processes to:
   - 6.1 Advise on appropriate social, economic and biophysical goals and targets;
   - 6.2 Advise on how to determine whether strategies and projects are contributing to the targets and outcomes required;
   - 6.3 Advise on how to ensure salinity funds are achieving positive change in priority areas on-the-ground; and
   - 6.4 Ensure monitoring arrangements are adequate as the basis for annual and five yearly reviews of the effectiveness of the Strategy in delivering relevant environmental and social outcomes.

Overall comments

The predicted extent of dryland salinity in Western Australia is very great and the threat to public and private assets is undeniably serious. The available evidence suggests that more than four million of 18 million hectares of agricultural and public land may be affected by salinity with significant impacts on biodiversity, water supplies, rural towns and other infrastructure.

With these projections it is not surprising that salinity has become an important catalyst for change in Western Australia. The Taskforce considers that much has been achieved since the Government launched the Salinity Action Plan in 1996. A primary achievement has been a much better understanding of the real scale of the problem and in the face of this, recognition that there are currently few economically viable options to manage salinity. The solutions to salinity are not simple. Salinity has also sparked serious debate about future land uses and what is actually achievable in terms of landscape change. Whole new areas of research have become established and there are increasingly urgent calls to recognise the roles of different approaches to salinity management.

The Salinity Taskforce considers that salinity can and should be usefully viewed as an opportunity and driver

to develop new sustainable industries, landscape systems and management techniques. In part, this means accepting that salinity will be part of our future landscape and must therefore influence our ways of doing business. A key part at the approach recommonded by the Taskforce is the creation of opportunities which are jointly positive for the community, the environment, and the economy. Substantial changes in current farming practices and land use will be part of this. In seeking this outcome the Salinity Taskforce recommends that the State should attempt to capitalise on opportunities that integrated responses to salinity management might present. These include opportunities through as yet undeveloped industries, such as in power generation, wood production, food production, mineral production, and carbon sequestration among others, and in the developed industries such as wool and meat production.

Strategic Directions

In responding to its Terms of Reference, the Taskforce has presented to Government a report that reflects both the messages it heard throughout its consultation and its own considered deliberations. The Taskforce concludes that the Government must continue to build on the substantial previous effort but with a renewed, clearly focused and targeted investment approach. Another priority is to build on the current natural resource management framework and link it to the Government's Sustainable Development initiative, to improve integration across government and the delivery of government services.

While the Taskforce has made a number of detailed recommendations, the following points and headings reflect the main elements of the strategic approach which the Taskforce is recommending in its report (relevant recommendations are listed in brackets).

A landscape Vision for the Future

- A comprehensive long-term vision for the landscape of the south west of Western Australia with an estimate of the long-term State budgetary requirement for achieving the vision (3.1) to guide coordinated action and provide a better basis for negotiation with the Commonwealth Government.

Targeted investment of public funds

- Future Government investment guided by the Framework for Investment in Salinity Management, currently being developed by the State Salinity Council (5.2.1).
- Substantial additional funding for the protection of public assets at risk from salinity (especially biodiversity) and the development of a Nature Conservation, Native Vegetation and Biodiversity Strategy (5.6.1 & 5.6.2).
- Substantial additional funding for the development of new commercially viable management options and industries including engineering options (5.3.3), perennial vegetation (5.3.11-5.3.14) and the productive use of saline land and water (5.3.15,5.3.16). A Development Plan for New Regional Industries should be developed to support this (5.3.10).

Better integration of Government actions for natural resource management and sustainable development

- A Statutory Natural Resource Management Council for Land and Water (5.5.1) and Natural Resource Management Office (5.5.4) to ensure coordinated activity across Government for salinity and natural resource management. Regional natural resource management groups will remain non-statutory but be strongly supported by Government (5.5.15), including through the development of partnership agreements (5.5.14).

An outcome-oriented monitoring and evaluation program

- A comprehensive monitoring and evaluation framework to inform the Government on progress and improve decision making about the effectiveness of existing activities and guide investment decisions (5.2.2 & 5.2.3).

Training and security for advisers as part of a new extension service

- A new training program for departmental staff and community support officers to improve technical expertise (5.4.6) and the extension of employment contracts for community support officers to five years (5.4.9) as part of enhance extension activities coordinated by the Department of Agriculture (5.4.15).

Refocussing Salinity Strategy 2000 to include the Targeted Approach and New Directions

- The development of a new Salinity Strategy to give effect to the Taskforce Report and any negotiated outcomes of the National Action Plan for Salinity and Water Quality (5.1.1).

Role of Government in salinity management

The Taskforce considers the Government has a fundamental responsibility in salinity management to protect significant public assets at risk and assist in the protection of private assets. The Taskforce considers the Government must invest in:

- protecting high-value public assets from the consequences of salinity;
- promoting and supporting actions undertaken on private land by developing new technologies and industries; and
- providing support and incentives for planning, coordination and implementation of on-ground works on private land.

The Taskforce notes Governments (both State and Commonwealth) have previously invested in each of these areas. However the Taskforce considers that, with current knowledge about the extent and impact of salinity, additional resources must now be directed at protecting public assets and developing new technologies and industries to manage salinity on private land. While planning, coordination and support of small-scale works remain important for natural resource management, this effort is less likely to achieve broadscale salinity management outcomes. The Taskforce has provided recommendations on the areas of priority investment throughout its report.

It was also clear from the majority of submissions, both written and verbal, that the investment of time, knowledge and money in salinity management must become more strategic than that undertaken thus far. The Taskforce therefore supports the ongoing development and application of the Framework for Investment in Salinity Management.

The need for vision and leadership

The current extent of salinity and its likely future extent has prompted calls for the development of a shared vision of the rural landscape in the future and continued leadership by Government on salinity management.

The Taskforce has recommended that the Government, through the Cabinet Standing Committee on Environmental Policy, develops a tangible vision of the future landscape of south western Australia. This vision should incorporate features including the areas at risk of salinity, lands suited to various agricultural practices, sites that may require restructuring for conservation or agricultural purposes and employment growth and regional development opportunities.

The existing State Salinity Strategy

(TOR 1)

The Taskforce acknowledges that the Salinity Strategy 2000 has effectively only been operational since March 2000. The findings of the Taskforce will not dramatically alter the principles of the Strategy, but will put greater emphasis on specific areas that require additional resources. The Taskforce recommendations on various aspects of the Salinity Strategy occur throughout its report.

In saying this however, the Taskforce considers that its findings and recommendations, together with other recent or pending initiatives (including the National Action Plan on Salinity and Water Quality, and the Government's new initiatives in engineering solutions and demonstration catchments) justify the preparation of a new salinity strategy.

Prioritising salinity management and monitoring effectiveness

(TOR 5 and 6)

The Taskforce considers that Government investment in salinity management must be carefully prioritised and commends the existing work done by the State Salinity Council on the proposed Framework for Investment in Salinity Management. The Taskforce considers that this must continue and must also inform Government's investment in the future, including negotiations on the Commonwealth Government's National Action Plan for Salinity and Water Quality. To work well, the investment framework must be undertaken rigorously and be supported by sound analyses. Additional resources are recommended to allow this to occur.

The Taskforce considers that there is also a significant need for a much improved monitoring and evaluation framework and has recommended additional resources be directed at developing and implementing this.

Technology and industry development for salinity management

(TOR 1.5, 1.2 and 1.4)

The Taskforce considers that there has been far too little Government investment in the development of technology and industry development for salinity management and to make productive use of salinised land and water. The Taskforce acknowledges the enormous effort that has gone to developing industries like oil mallees and that initiatives such as the Cooperative Research Centre for Plant-Based Management of Dryland Salinity will contribute to this area.

Even so the Taskforce is firmly of the opinion that much more should be done, in particular with the increasingly significant farming industry groups, such as the Liebe Group, the Facey Group, the Saltland Pastures Association and the Oil Mallee Association. In addition to recommending the development of an overall Development Plan for New Regional Industries to provide impetus and coordination, the Taskforce also recommends additional resources be provided to develop specific initiatives further.

The Taskforce contends that engineering solutions will become increasingly important in managing salinity, particularly around public assets. The Government's proposed engineering investigations initiative is therefore supported with recommendations and with the overall qualification that the community must be closely involved in the research and development of successful engineering solutions.

Community support, capacity building and mechanisms to encourage change
(TOR 1.7 and 1.1)

The Taskforce recognises the enormous effort that individual farmers and community members, catchment and landcare groups, farmer and industry groups, natural resource management regional groups and others have dedicated to salinity and natural resource management in Western Australia. The Government must continue to support this effort to ensure that the community has the capacity to be able to continue to respond to salinity in the longer term.

The Taskforce has recommended additional effort in focusing and coordinating Government departments' extension services, technical training for Community Support Officers and other extension agents and additional effort by Government departments to ensure the best available information on salinity and its management is widely available to, and understood by, land managers. Specific effort also needs to be made to ensure Indigenous people are involved with and contribute to salinity management in Western Australia.

Institutional arrangements and partnerships
(TOR 3, 1.6, 1.3 and 4)

The Taskforce considers that there is an ongoing need to ensure coordination of Government action, holistic policy advice to Government and genuine community involvement and interface on salinity management and natural resource management at the State and regional levels. The Taskforce is therefore recommending that a Natural Resource Management Council for Land and Water be established to achieve the necessary integrated and coordinated response to salinity and other natural resource management issues, as no single Department or Minister is solely responsible for these matters in Western Australia. This Council should report to and advise jointly the Ministers for the Environment and Heritage and Agriculture, Forestry and Fisheries.

The Taskforce also recommends that the Council is chaired by an independent community member with a membership including the Directors General of the three natural resource management departments and nine other members with expertise in key areas. Under this model the State Salinity Council would be discontinued. However, the Taskforce considers that it is not in the interest of the State to immediately lose the expertise of the State Salinity Council and therefore recommends an interim arrangement where the State Salinity Council Executive becomes a committee of the Council.

The Council would be supported by a Natural Resource Management Office and created under a Natural Resource Management Act. The Taskforce has identified a number of options for the location of the Natural Resource Management Office including within a Ministerial Office, the Department of the Premier and Cabinet, the Department of Environment, Water and Catchment Protection, the Department of Agriculture or the Department of Conservation. Under this arrangement, the existing Natural Heritage Trust secretariat would also be based within the proposed Natural Resource Management Office.

The Taskforce considers that the Government should enter a genuine partnership with Natural Resource Management Regional Groups and that this should be reinforced through a new Natural Resource Management Policy and ongoing provision for core administrative support. In addition, the natural resource management regional groups are becoming increasingly important under the National Action Plan for Salinity and Water Quality and their roles therefore need to be redefined. In supporting regional development initiatives there is also a need for these groups to forge stronger links with local government and Regional Development Commissions.

The Taskforce recommends that the proposed Natural Resource Management Office be a central coordination point between the Natural Resource Management Regional Groups and Government departments. However, the Taskforce also considers that the responsibility for providing administrative support should be consolidated with the Department of Environment, Water and Catchment Protection, enabling the Department of Agriculture to focus on its core business of farm viability and sustainability and increased liaison with the emerging farmer industry groups.

The Taskforce considers that more effort must be made to better engage local government with salinity and natural resource management. This tier of Government has much to lose from salinity and much to gain from being involved with its management, and its lack of engagement in the past needs urgent attention.

Managing salinity's impacts on biodiversity, public assets and communities
(TOR 1.8)

The Taskforce is concerned at the substantial threat that salinity poses to public assets such as biodiversity on public and private lands, conservation reserves, public water supply catchments, rural towns and other infrastructure such as roads and rail. The Taskforce considers that both State and Commonwealth Governments must invest significant resources in this area and the Taskforce has recommended increased investment and attention to these areas.

Future investment directions

(TOR 2.1 and 2.2)

The Taskforce has concluded that the existing level of response to salinity in Western Australia does not sufficiently respond to the scale of the problem, particularly as we are now more aware of the greater threat to public assets such as biodiversity.

Accordingly the Taskforce has identified a number of actions that are not currently funded or that require additional funding.

In preparing these recommendations, the Taskforce has attempted to indicate the level of funding that should be directed to particular areas. The Taskforce has not attempted to prescribe the source or the amount of funding. In most of the recommendations the Taskforce has recommended that funding should be additional to that already allocated to the receiving department.

It is the strong view of the Taskforce that the State should endeavour to secure funding under the National Action Plan for Salinity and Water Quality for all of these initiatives.

Finally, the Taskforce appreciated the opportunity provided by the Government to take stock and to review the direction of the State in salinity management, and recommend future directions. We trust that the recommendations will assist the State to go forward with confidence during the next five years. The Taskforce emphasises however, that ongoing salinity management will require that the approach remains flexible, adaptive and responsive, and evolve as new pressures emerge, new technologies become available and our knowledge improves. The Government must continue to review its direction and activities over time.

1. Introduction

The Minister for the Environment and Heritage and Minister with Special Responsibility for Salinity, Dr Judy Edwards MLA, announced the formation of the Salinity Taskforce on 31 May 2001 to recommend future strategies to combat salinity. The Taskforce was necessary to provide a more targeted and cohesive response to Western Australia's salinity threat and to review how salinity could be managed in the broader context of natural resources management. The Taskforce has maintained close liaison with Minister Edwards and the Hon Kim Chance MLC, Minister for Agriculture, Forestry and Fisheries.

The Taskforce has consulted widely in preparing its report and recommendations. In addition, the Taskforce received 141 written submissions responding to its Terms of Reference (see Appendix 1). A number of quotes from the written submissions have been included in this report. More than 200 people attended public meetings with the Taskforce in Esperance, Jerramungup, Boyup Brook, Merredin, Three Springs and Perth (see Appendix 2). The Taskforce has also met separately with a range of key stakeholders, including Government departments, the State Salinity Council, Natural Resource Management Regional Groups, non-Government environment organisations and a range of groups and organisations representing farmers.

This extensive consultation has provided the Taskforce with a good appreciation of the priority issues that people consider must be resolved to improve further the State's response to salinity and its management in a natural resource management context. The Taskforce has also heard divergent views on a range of issues including deep drainage and wetland conservation, highlighting the complexity of salinity and the need for balance in deciding appropriate responses to its management.

The Government directed the Taskforce to respond to the following Terms of Reference.

1. Review the strategies and actions of the State Salinity Action Plan and Strategy, and their implementation, paying special attention to:
   - 1.1 Community support and capacity building;
   - 1.2 Progress in assessing the feasibility of engineering options;
   - 1.3 Integration of actions across Government at Ministerial, agency and regional levels;
   - 1.4 The potential role of industry, and research and development groups in salinity management;
   - 1.5 Progress in the development of new solutions, including the level of support to development programs;
   - 1.6 The relationship to and the congruence with regional natural resource management strategies;
   - 1.7 Mechanisms to encourage adoption of improvements in land management practices and to discourage continuation of inappropriate land management practices; and
   - 1.8 Mechanisms to support biodiversity protection.
2. In a strategic context, advise on the adequacy of the State's Salinity Program, paying special attention to:
   - 2.1 Funding gaps ie. actions which are not funded in the current program; and
   - 2.2 Whether the level of response is appropriate for the scale of the problem.
3. Review the statewide structures that support a whole of government and community partnership approach to the implementation of the State Salinity Strategy and Action Plan.
4. Review the processes through which these statewide structures report and are accountable to government and the community.
5. Taking into consideration the development of the Inter-Governmental and Bilateral Agreements for the National Action Plan for Salinity and Water Quality and other national, state and regional funding programs, review the process for prioritising the future expenditure of funds to combat salinity.
6. Review existing monitoring and evaluation arrangements and processes to:
   - 6.1 Advise on appropriate social, economic and biophysical goals and targets;
   - 6.2 Advise on how to determine whether strategies and projects are contributing to the targets and outcomes required;
   - 6.3 Advise on how to ensure salinity funds are achieving positive change in priority areas on-the-ground; and
   - 6.4 Ensure monitoring arrangements are adequate as the basis for annual and five yearly reviews of the effectiveness of the Strategy in delivering relevant environmental and social outcomes.

The other sections of the Taskforce report are described below. For consistency, the Taskforce report refers to Government departments by the titles recommended by the Machinery of Government Taskforce, including the Department of Agriculture, the Department of Conservation, the Department of Environment, Water and Catchment Protection and the Department of Local Government and Regional Development.

The Taskforce has also included quotations taken from written submissions at the beginning of each of

the following sections that highlight the strength and diversity of views that the Taskforce considered in preparing its report.

Section 2 - A New Position on Salinity and its Management

This section describes the position the Taskforce adopted in considering how best to apply limited Government resources and effort to managing salinity in Western Australia. It is important that this position is clearly stated as it has guided the Taskforce's deliberations and recommendations and makes clear the assumptions that the Taskforce holds in relation to salinity and its management.

Section 3 - Leadership and Vision

This section outlines why the Taskforce considers that the Government must lead the way in developing a shared vision for the future of the landscape of the South West of Western Australia and in guiding future Government and community effort and investment in salinity.

Section 4 - Background

This section provides background information on dryland salinity in Western Australia, including describing recent policy responses to this issue as well as the available treatments and issues associated with 'living with salinity'. The economics of salinity management are also discussed, as are the social issues arising from the need for broadscale treatment of salinity.

Section 5 - Findings and Recommendation

This section describes the findings of the Taskforce and its recommendations to Government. The Taskforce has written its findings and recommendations against the following headings in responding to its Terms of Reference (listed in brackets).

5.1 The Existing State Salinity Strategy (TOR 1)

5.2 Prioritising Salinity Investment and Monitoring Effectiveness
- Prioritisation of Government Investment in Salinity (TOR 5)
- Monitoring and Evaluation (TOR 6)

5.3 Technology and Industry Development for Salinity Management
- Progress in Developing New Solutions (TOR 1.5)
  - Engineering Options (TOR 1.2)
- The Potential Role of Industry and Research and Development Groups in Salinity Management (TOR 1.4)

5.4 Community Support, Capacity Building and Mechanisms to Encourage Change
- Mechanisms to encourage adoption of improvements in land management practices and to discourage continuation of inappropriate land management practices (1.7)
  - Community Capacity Building (TOR 1.1)

5.5 Institutional Arrangements and Partnerships
- Review the statewide structures that support a whole of government and community approach to implementation of the Salinity Strategy and Action Plan (TOR 3)
- The relationship to and congruence with regional Natural Resource Management Strategies (TOR 1.6)
- Integration of actions across Government at Ministerial, agency and regional level (TOR 1.3)
- Review the processes through which statewide structures report and are accountable to government and the community (TOR 4)

5.6 Managing Salinity's Impacts on Biodiversity, Public Assets and Communities
- Biodiversity and Environmental Assets (TOR 1.8)

Section 6 - Future Investment Directions

This section summarises the future investment directions proposed by the Taskforce and responds to Term of Reference 2 including:
- Funding gaps; actions not funded in the current program (TOR 2.1)
- Whether the Level of Response is appropriate for the scale of the problem (TOR 2.2)

2. A New Position on Salinity and its Management

The Taskforce considers that the Government has a fundamental responsibility in salinity management to protect public assets and to assist in the protection of private assets.

There are three main actions that Government should be leading:

1. Protection of outstanding **public assets** from the consequences of salinity and other forms of resource degradation (e.g. water resource catchments, threatened high-value conservation areas or rural towns);
2. Investment in and support for major actions on **private land** by developing new technologies and new industries (e.g. perennial plants for salinity prevention, salt tolerant plants for productive use of saline land or engineering options); and
3. Support and incentives for planning, coordination and implementation of smaller on-ground works on **private land** (e.g. for water management and protection of biodiversity).

It is important to distinguish between these because:

- while all are important not all have been adequately recognised or resourced in Government strategies and programs to date;
- each action needs to be pursued in different ways, with different roles and emphases by Government, community groups and individuals;
- acceptance of these three distinct actions has important implications for future salinity strategies. If Government accepts the Taskforce's advice on the relative emphasis of each action, this should shape Western Australia's negotiations with the Commonwealth Government on the National Action Plan for Salinity and Water Quality and phase two of the Natural Heritage Trust; and
- many written and verbal submissions to the Taskforce also drew these distinctions and indicated that current mechanisms and programs do not appropriately prioritise the three types of action.

These categories do not encompass every aspect of government involvement in salinity (e.g. statewide monitoring and evaluation). However, the Taskforce considers that collectively they capture the key roles directly related to achieving change on the ground.

2.1 Targeted intervention to protect particular public assets

Previously, salinity has been seen as a problem that would be addressed by landholders across the entire landscape with the protection of public assets achieved as a result of the voluntary actions of landholders. In Western Australia the need for targeting of priority assets was recognised in the 1996 Salinity Action Plan with the establishment of Water Resource Recovery Catchments, the Rural Towns Program and Natural Diversity Recovery Catchments.

Further improvement in scientific understanding of salinity has highlighted that:

- Other than in some Recovery Catchments, the level of adoption by landholders of salinity prevention measures is generally only a small proportion of that needed to prevent impacts on public assets and that this is likely to continue to be the case for some time.
- Even if landholders were to increase dramatically and immediately the adoption of salinity management measures there would be continuing damage to key public assets as watertables shift to a new equilibrium over the coming decades.
- For some key public assets at risk, the priority need is for works within or immediately adjacent to the assets. Often this will require engineering solutions, especially where salinisation is well advanced. Work in the surrounding catchment could provide benefits in the longer term but will be insufficient to protect these public assets in the short to medium term.

These insights indicate the need for a much more targeted and selective approach to protection of public assets from salinity. The Taskforce considers that public assets must continue to be identified and prioritised for action because of the richness of the biodiversity and the high value of the public infrastructure and public water supplies that are at risk.

The new Salinity Strategy should focus on determining what action is required to protect specific public assets and importantly, whether those actions are justified. This will be achieved through the proposed Framework for Investment in Salinity Management, discussed in Section 5.2.

2.2 Development of new technologies and new industries

The highly-targeted approach to protecting public assets described above implies that only small areas of farm land would qualify for direct public funding for the purposes of implementation of on-ground works to prevent salinity impacting public assets.

For other farmland, salinity management would primarily be the responsibility of farmers with limited direct financial support from Government.

However the Taskforce is well aware that

technologies and farming systems which allow farmers to deal with salinity at a large scale are viable in only a few parts of the State where farmland is at risk (e.g. the broadscale planting of lucerne in some regions).

Therefore the Taskforce considers that there is a need to better develop new technologies and farming systems in four broad areas. These are:

- various kinds of engineering works;
- profitable perennials for recharge areas (for salinity prevention);
- salt-tolerant plants to make use of saline land; and
- methods to utilise saline water economically.

All of these are important and all have their place in delivering options and solutions for salinity management.

The Taskforce notes in particular the ground swell of support amongst farmers for the use of engineering solutions to combat salinity, particularly by deep-drainage. While there are some situations in which drainage appears to be having a beneficial impact, it is still unclear in what circumstances drainage will be best applied to be effective and economic. There are conflicting views within the farming and scientific communities about the efficacy of engineering solutions to reduce salinity and the significance of potential down-stream impacts. This conflict and uncertainty reinforces the need for far greater resourcing and effort in this area.

Even with concerted efforts under the Salinity Strategy and by groups and individuals, the realistic prognosis is for a continuing worsening of salinity impacts in future. This highlights the importance of developing improved methods for making productive use of saline land and saline water.

Of these four types of technology, the most challenging may be the development of new profitable perennials for recharge areas. Realistically this will be a slow and expensive process with failures as well as successes. In addition, recent studies indicate that even if perennials are established over large areas, salinity in many catchments will continue to worsen (although at a reduced rate and to a lower final equilibrium level). Therefore we must be clear about the rationale for pursuing this approach. Reasons for advocating it include the following:

- Profitable perennials are the only prospect for prevention (as opposed to remediation) of salinity on most of the threatened agricultural land.
- Substantial improvements in the range and scope of profitable perennials seem achievable.
- Of the four types of technology for salinity management on farms, public off-site benefits would arise primarily from salinity prevention using perennials.
- In situations where subsidies for perennials on farms may be appropriate (ie. on farms near to the key public assets) the level of subsidy can be reduced if the perennials are less costly/more profitable. Therefore public funds can be saved and directed to other priorities.
- More profitable perennials will dramatically reduce the problem of achieving widespread adoption.
- Profitable perennials could also attract private sector finance to meet the establishment costs, which are beyond the means of many farmers.
- New industries based on perennials will generate social benefits to rural regions, resulting from greater wealth and employment. This includes the potential to introduce new industries such as bio-energy, bio-fuels for transport, aquaculture and wood products, as well as maintaining existing industries such as wool and meat production with the introduction of perennial pastures.

In all likelihood, the salinity-related benefits from new industries based on perennials will be small relative to the total of other benefits of such industries, which will include profitability, diversification, regional development and broader environmental benefits. Nevertheless, salinity provides an imperative to pursue this approach, since large-scale salinity prevention on farmland is probably not achievable by any other means.

2.3 Planning, coordination and implementation of on-ground works

This category represents the dominant approach to salinity policy in Australia over the past 10 years, primarily driven by the Commonwealth Government's National Landcare Program and continued by the Natural Heritage Trust. The approach relies on voluntary actions of catchment groups coupled with partial subsidies for on-ground works. The Taskforce considers that this approach remains dominant in the thinking behind the National Action Plan for Salinity and Water Quality.

The Taskforce believes that this approach will not achieve change on the scale necessary to manage salinity. While a range of important benefits for farmers and the broader community have resulted from the National Landcare Program and the Natural Heritage Trust (including benefits to biodiversity conservation and waterways) in many locations salinity prevention benefits are a minor outcome. This is because of the scale of change needed for effective salinity prevention, the great expenses involved in acting at that scale and the

ineffectiveness of small-scale changes.

A further important outcome from this category of action has been awareness about salinity and other natural resource management issues. This foundation of knowledge means that Western Australia is very well placed to take the next step in its salinity management strategy.

2.4 Implications of the Salinity Taskforce position for Governments' response

The Taskforce notes that the Salinity Strategy 2000 contains elements of all three of the actions described previously. However, within Western Australia, the Taskforce considers that the development of new technologies and new industries for salinity management requires significantly increased attention by both the State and the Commonwealth Governments.

The Taskforce also considers that the National Action Plan for Salinity and Water Quality is deficient in its dominant emphasis on funding delivery through regional groups, implying an emphasis on planning and coordination for on-ground works (which will achieve relatively little for salinity management in most threatened areas of Western Australia). The National Action Plan should focus on the targeted protection of public assets and the development of new technologies, new industries for salinity management and developing technologies to make salinity management information more accessible to land managers and Natural Resource Management Regional Groups.

The Taskforce appreciates the considerable work in planning and coordination that many catchment and sub-catchment groups have already undertaken during the Decade of Landcare. While the Taskforce considers that planning and coordination for on-ground work remains vital to achieve other natural resource management outcomes (such as on-farm biodiversity protection and reduction of sediment and nutrient flows into waterways) it is less likely to achieve a widespread reduction in salinity. The main salinity-related contribution from this approach is in the management of water flows from engineering works. Therefore, planning and coordination for on-ground works should primarily be addressed within the new Natural Heritage Trust Program rather than the National Action Plan for Salinity and Water Quality.

What people said about leadership and vision

"Life in rural Western Australia is changing, perhaps faster than we as human beings can cope with, but by working together I'm sure that a new 'face' can be developed for Western Australia. It will be different, but it will be new and exciting and with a shared vision we can look to the future together. There will be a future, it will just be different from the past and we need to have the 'tools' and 'training' to cope with the change."

Monica Durcan

"There is also a need for the Government to communicate a clear vision that is prepared to support saving the long-term economic benefits of agricultural production and its multiplier effect on employment and wealth creation. This objective tends to be lost in debates of 'public good v private good'. It also tends to be secondary to saving biodiversity and rural infrastructure when the interdependence well being of them all should be obvious".

Western Australian Farmers' Federation

"We need to more clearly articulate what our vision is. The vision would address what the landscape should look like, what agriculture should look like. To us, it is also about doing agriculture differently and reinventing agriculture in Western Australia. We envisage a landscape dominated by deep rooted perennials, much of them woody perennials with more varied sources of income, some production based, some for carbon credits, some for biodiversity credits/ecosystem services, some for off-farm stewardship. Important catchments and maybe all catchments will need to be managed collectively with payments between managers within the catchment and to and from other beneficiaries."

Conservation Council of Western Australia

"Leadership should be able to resist political, bureaucratic and community pressures but at the same time maintain an open mind to fresh ideas and approaches."

H M Churchward

3. Leadership and Vision

The vision - a new sustainable landscape

Successfully managing salinity and other land and water degradation problems that beset our landscape will require a long-term strategy over many years - beyond the normal terms of Governments and probably over several generations. To succeed, the Taskforce considers that a clear and tangible vision of where we as a community want to go is needed. Strong leadership from Governments, industry and the community is required.

In developing this vision it will be necessary for Government and the community to be informed of the long-term costs and benefits associated with salinity management so that public and private money is invested wisely and sufficient funding is committed over time. The Taskforce therefore considers that repairing and maintaining Western Australia's natural capital assets of land, water and vegetation requires ongoing commitment by Government and should therefore be accommodated within successive State Budgets as for other core areas of Government, such as health, education and justice.

Several visions for the rural areas of the South West of Western Australia have been developed for regional strategies and plans or at conferences. Virtually all contain similar themes of revitalised communities living in healthy sustainable landscapes. A good example is a recent vision statement from the 'Managing Salinity in Wheatbelt Valley Floors' conference held in Merredin from 30 July to 1 August 2001:

> *A revitalised rural community, working together, that has achieved positive change to create a healthy, well-drained landscape maximising biodiversity and landscape resilience with sustainable economic returns from existing and new industries.*

A key step to achieve such a vision and manage salinity is to define as far as possible the options for using and managing the land and water resources across the landscape. This will involve identifying the parts of the landscape where natural areas of bush will remain and be connected, where high water tables will occur and salinity will spread, and as a consequence, which areas will be suitable for existing and new agricultural industries.

Much of the work necessary to define such a 'landscape vision' has been done in the past few years. Creating a tangible vision of how the future landscape will look will assist in setting priorities under the proposed Investment Framework and support new industries such as 'oil mallees', bush networks for biodiversity and regional development opportunities.

The Taskforce considers it is important to begin defining collectively how the Western Australian community wants the landscape in the South West of Western Australia to look in the future, even though the vision will evolve and change as we learn more.

Recommendation 3.1

The Salinity Taskforce recommends that the State Government, through the Cabinet Standing Committee on Environmental Policy, establishes a tangible long-term vision for the landscape of the South West of Western Australia with an estimate of the long-term State budgetary requirement for achieving the vision.

The vision should incorporate as far as possible:

- *identification of areas with high water tables with the potential to become saline;*
- *a network of natural systems, including high priority conservation areas and remnant native vegetation on private lands;*
- *lands suitable for agro-forestry (with twin objectives of commercial returns and lowering watertables);*
- *lands where other new agricultural practices will be needed to reduce water tables;*
- *saline land which could be used for productive and nature conservation purposes;*
- *areas where restructuring may be needed for agricultural or conservation purposes; and*
- *employment growth and regional development.*

4. Background

4.1 Policy History

Agricultural development in Western Australia was guided by visions and policies that aimed to increase the wealth and productivity of the state and to provide agriculture with opportunities for expansion and profitability. Governments in the 1920s and 1930s invested heavily in rural infrastructure, notably the Goldfields pipeline, railway networks and settlement schemes to support continued expansion and development of agricultural regions. Decisions on clearing were based on whether a soil was Class I, Class II or Class III as determined by its inherent fertility and production potential. Environmental impacts, including salinity, were not considered in this classification system despite the link between clearing and salinity having been made (Woods 1924).

Estimates of the impact of salinity on agricultural production and development were published in the 1970s. The prevailing view was that salt-affected land would comprise less than 2 per cent of the landscape and therefore that salinity was unlikely to have a substantial impact on agriculture (Burvill 1979). Policies and research in agriculture continued to be directed towards improving the production potential of existing systems.

During the 1980s, there was a growth in awareness of natural resource management issues in agriculture. Declining water quality, soil erosion, loss of native species and salinity were attributed to agricultural practices and the need for new strategies to manage agricultural resources was recognised. In response, the Commowealth Government announced the National Soil Conservation Program, which evolved to become the National Landcare Program in 1989. The National Landcare Program leveraged resources from state governments and private land managers, directing the funds into land management, catchment planning and Community Landcare Coordinators. While the National Landcare Program was effective in drawing attention to the potential benefits of partnership approaches and maintaining a focus on management of natural resources, there was concern that salinity management would require a far more integrated and strategic approach - a theme that remains relevant in 2001.

In Western Australia, such an integrated and strategic approach was attempted in the 1996 Salinity Action Plan, developed primarily by four State Government departments. At about that time the National Landcare Program was subsumed within the Natural Heritage Trust, a program that continued support for catchment groups and community support, with a renewed emphasis on on-ground works. Biodiversity and native vegetation as well as waterways, world heritage and oceans were also emphasised in the Natural Heritage Trust.

The Salinity Action Plan, while an important step, was criticised for its lack of community consultation, particularly in the development of priorities and final recommendations, and for a number of important omissions. In response to these concerns, a process of extensive consultation was undertaken, culminating in the release of a revised (draft) Salinity Strategy in 1998.

Soon after that release, important new hydrological research was completed, revealing what is now regarded as a more accurate perspective on the difficulty of preventing salinity in this state. From the research it became clear that the State Government and private land managers could not expect to 'solve' salinity, particularly not with the strategies and management options currently available.

This perspective was reflected in the Salinity Strategy 2000, although the detailed implications of the new hydrological information were not fully developed. The Strategy highlighted the importance of community participation, the role of regional and community groups, a requirement for ongoing on-ground works and monitoring and evaluation. The importance of new industries and systems was also stated in this Strategy.

With the end of the Decade of Landcare, there was growing recognition and acceptance that, if salinity was to be managed successfully in Western Australia, a new approach would be required, away from the 'Landcare' paradigm and focusing more on strategic investment decisions and industry development opportunities. Farmers were calling for an increased emphasis on technologies to help them better manage salinity, including engineering methods, and commercial land use options with salinity benefits.

This new emphasis on development of management options for salinity was reflected in a proposal for a new Cooperative Research Centre for Plant-Based Management of Dryland Salinity, headquartered at the University of Western Australia (funded in January 2001), and an election commitment by the then opposition Labor Party for a major initiative to investigate and demonstrate engineering options for salinity management. The State Salinity Council initiated a 'Framework for Investment in Salinity Management', to support a more strategic and targeted approach to investment.

The rapidly evolving understanding of salinity in Western Australia was only partly reflected in the National Action Plan for Salinity and Water Quality, announced by the Commonwealth Government in October 2000. This contributed to difficulties for the State in negotiating an acceptable agreement with the Commonwealth Government under the Plan.

On 31 May 2001, the State Government announced the establishment of a Salinity Taskforce. The Taskforce was to review the current direction of

Table 1. Examples of impacts from dryland salinity

Type of salinity cost	Agricultural impacts	Non-agricultural impacts
Preventative action	Costs of establishing preventative treatments: areas of perennial plants, surface drainage	Costs of engineering works (pumps, drains, evaporation basins) and revegetation to protect buildings, roads, bridges and other infrastructure
Replacement, repairs and maintenance	Repairs to buildings, replacement of dams, establishment of deep drains to lower saline groundwater	Repairs to houses and other buildings, desalination of water resources, repairs to infrastructure, restoration of natural environments
Direct losses	Reduced agricultural production, reduced flexibility of farm management	Extinctions, loss of biodiversity, loss of amenity, loss of aesthetic values, loss of water resources, eutrophication of waterways, loss of development opportunities on flood plains

salinity investment in Western Australia and advise government on future directions for state strategies and policies.

4.2 Origin, Impact and Extent of Salinity

4.2.1 Origin of Dryland Salinity

Salt, mainly sodium chloride, occurs naturally at high levels in the subsoils of most Australian agricultural land. It has been carried inland from the oceans on prevailing winds and deposited in small amounts (20-200 kg/ha/year) with rainfall and dust (Hingston and Gailitis 1976). Over tens of thousands of years, it has accumulated in sub-soils and in Western Australia it is commonly measured at levels between 100 and 15,000 tonnes per ha (McFarlane and George 1992).

Prior to European settlement, groundwater tables in Australia were in long-term equilibrium. In agricultural regions, settlers cleared most of the native vegetation and replaced it with annual crop and pasture species, which allow a larger proportion of rainfall to remain unused by plants and to enter the groundwater (George et al. 1997; Walker et al. 1999). As a result, groundwater tables have risen, bringing dissolved accumulated salt to the surface (Anonymous 1996). Patterns and rates of groundwater change vary widely but most bores show a rising trend, except where they have already reached the surface or during periods of low rainfall. Common rates of rise are 10 to 30 cm/year (e.g. Ferdowsian et al., 2001). Given the geological history and characteristics of the Australian continent, large-scale salinisation of land and water resources following clearing for agriculture was inevitable.

4.2.2 Impact and Extent of Salinity in Western Australia

Ferdowsian et al. (1996) estimated that the area of agricultural land in Western Australia affected by salinity[1] was 1.8 million ha in 1994 (approaching 10 per cent of the total area of cleared agricultural land). Using a different method, the National Land and Water Resources Audit (2000) estimated that the area of all land "at risk"[2] in Western Australia is currently 4.4 million ha and will be 8.8 million ha by 2050. The proportion of agricultural land in Western Australia that is salt-affected may exceed 30 per cent within the next 50 to 100 years (Short and McConnell, 2001). Nationally, Western Australia has by far the greatest area at risk, with 80 per cent of the current national total, and 50 per cent of the 2050 forecast area at risk (National Land and Water Resources Audit, 2000).

Shallow saline groundwaters have a multitude of costly consequences, as summarised in Table 1. Although traditionally seen primarily as an agricultural problem, it is now appreciated that the non-agricultural impacts are likely to be at least as significant.

Salinity is rising in most rivers of the southwest (Hatton and Salama 1999) including rivers currently or likely to become used for potable water supplies.

According to George et al. (1999b) in Western Australia, without massive intervention, most or all of the wetland, dampland and woodland communities in the lower parts of catchments will be lost to salinity. There are at least 450 plant species which occur only in these environments and are at high risk of extinction (State Salinity Council 2000; Keighery, 2000). There are also an unknown number of invertebrates at risk. For example, recent surveys by CALM have found that in the areas of Western Australia at risk from salinity, arachnids alone number at least 700 species, with around half of those species previously undescribed.

Increased flood risks have been studied for only a small number of case studies (e.g. Bowman and Ruprecht 2000). Based on these, George et al.

1. Defined as land on which wheat yield would be reduced by 50 per cent or more.
2. Defined as land with a groundwater table which is either (a) less than 2 m from the surface, or (b) between 2 and 5 m and rising.

(1999b) concluded that, with the predicted two- to four-fold increase in area of wheatbelt land with shallow watertables, there will be at least a two-fold increase in flood flows.

Infrastructure at risk has also been identified and valued in case studies. For example, Campbell et al. (2000) estimated for a sub-region of south-west Western Australia[3] that 1200 buildings (15 per cent of all buildings in the region), 3,300 km of roads (28 per cent) and 16,000 farm dams (44 per cent) face damage or destruction from salinity.

Short and McConnell (2001), summarised by the National Land and Water Resources Audit (2000), quantified a number of the key assets at risk over the next 50 years (Table 2).

Table 2 Key assets at risk from dryland salinity in Western Australia

Assets	2000	2050*
Agricultural land (ha)	3,600,000	6,500,000
Perennial vegetation (ha)	600,000	1,800,000
Important wetlands (ha)	72,000	80,000
Highways (km)	720	1,500
Primary roads (km)	680	1,200
Secondary roads (km)	1,200	2,300
Minor roads (km)	12,000	23,000
Rail (km)	1,400	2,200
Stream length (km)	1,500	2,800
Towns (number)	20	29
Important wetlands (number)	21	21

* Predictions based on groundwater trends and 'best guess' future land use.

4.3 Treatments and Their Impacts

Most of the forecasts which have been made about future salinity impacts are based on a "business as usual" scenario. Sufficiently intensive responses to salinity will reduce the forecast impacts. This section covers the establishment of perennial plants for prevention of groundwater rise, and a range of engineering options for managing water. The following section covers "living with salinity", including plant-based options for farming salinised land, and a range of options for making use of salinised land and water.

4.3.1 Perennials to prevent groundwater rise

Most plant species used in commercial agriculture are relatively shallow-rooted and "annual" in nature. Deep-rooted perennial plants reduce the rate of groundwater rise by using a larger proportion of the available rainfall before it drains below the root zone. There are a number of deep-rooted perennials currently being planted by farmers, including:

- lucerne, a perennial pasture plant which is reported to have been established over 100,000 ha;
- blue gums, a commercial woody perennial suitable for high rainfall zones, grown mainly for wood chips;
- maritime pines, a commercial woody perennial grown for timber, which is mainly being established on poor soil types, on which it grows relatively well;
- tagasaste, a woody perennial used to provide grazing for livestock, particularly cattle;
- oil mallees, a woody perennial that, it is hoped, will provide feedstocks for bioenergy production, as well as oil extracted from leaves, and activated carbon;
- eucalypts for commercial saw logs in medium rainfall zones; and
- non-commercial native vegetation for biodiversity enhancement.

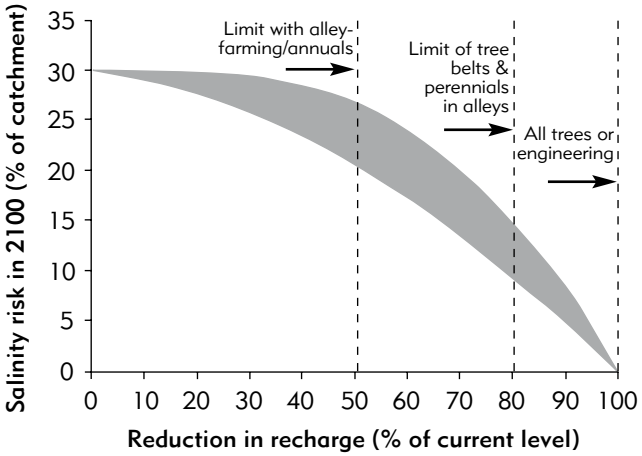
Although this list appears encouraging, the areas of perennial vegetation recommended by hydrologists for prevention of groundwater rise are extremely high. Areas of perennials currently in place or in prospect are very small compared to the areas needed for effective salinity prevention. In recent years, we have lost earlier hopes that large-scale preventative impacts on salinity could be achieved by clever selection and placement of relatively small-scale treatments, or by changes to the management of traditional annual crops and pastures.

The new scientific consensus is that large proportions of land in threatened catchments would need to be revegetated with deep-rooted perennial plants for at least part of the time[4].

Even with massive changes in land use, the long-run potential to prevent salinity is believed to be limited in many catchments of Western Australia, particularly many of those in lower rainfall areas. This is because the catchments in low rainfall regions tend to be larger, flatter and less well drained than elsewhere. Figure 1 shows the results of hydrological modelling for several catchments in Western Australia (George et al. 1999b). These results indicate that if recharge across a catchment were reduced by 50 per cent (implying perennials on more than 50 per cent of the land) the salinity risk[5] in the catchment would be averted on between 3 and 12 per cent of the catchment.

3. The region comprises the Western South Coast (Mt Barker Landsat TM scene) and the Upper Blackwood Catchment (Dumbleyung and the Bunbury scene as far west as the Towerinning Catchment). The total area is about 30,000 km^2 (3 million ha).
4. Some of the proposed systems for perennial production involve phases of perennials for some years, followed by some years of traditional annual crops or pastures. In other systems, perennials may be grown more or less permanently in belts or blocks.
5. The indicator of salinity risk shown in Figure 1 is not "area of salinity" but "flowtube length with high risk of a shallow water table".

Figure 1. Responsiveness of dryland salinity to reduced recharge (e.g. from perennials or drainage) in a range of catchment types in Western Australia, assuming that "business as usual" would result in high salinity risk on 30 percent of the catchment.
(source: based on George et al. 1999b)



The timing of treatment impacts is also important. On the positive side, even where equilibrium areas of salinity are reduced little, the implementation of large-scale revegetation programs is likely to delay the process of reaching that equilibrium by between 20 and 80 years (Campbell et al. 2000).

On the negative side, given the slow rate of development of salinity, the benefits of treatments implemented now may be well into the future. Although local reductions in watertables can be achieved within a year or two (George et al. 1999a), catchment-scale impacts, such as reductions of saline discharges into waterways, will be very much slower. In catchments having regional groundwater flow systems[6], much of the benefits will probably be a century or more in the future (Hatton and Nulsen 1999; Hatton and Salama 1999). This is because regional flow systems are large and, particularly in Western Australia, groundwater movement within them is generally slow.

4.3.2 Engineering methods for water management
Engineering methods provide an alternative or a supplement to perennial vegetation.

Shallow drainage for surface water management is recognised as a key strategy throughout the agricultural region of Western Australia. It is clearly cheaper to prevent water reaching the groundwater than to extract it from the groundwater later. As well as long-term salinity benefits, surface water management can provide short-term benefits from reduced water logging. If waters leaving a farm are mainly surface waters, they are less likely to salinise water resources and other assets downstream. Surface water management at the catchment scale requires planning and a degree of cooperation between neighbouring farmers.

Increasingly, farmers are interested in deep drainage on valley floors, to protect or reclaim areas. There are some areas of controversy regarding deep drains. There are widely differing views about their effectiveness and the likely causes of their observed effects, and there are concerns about the downstream impacts of saline discharge waters from deep drains. However, deep drains are being installed at a rapid rate, with or without the appropriate approvals, so it is important to address these areas of controversy urgently. Recent measurements by CSIRO of deep drains at Narembeen are revealing greater levels of groundwater draw down than in some earlier studies, further highlighting the need for more comprehensive and detailed assessments of these drains.

A key issue to resolve with deep drainage is the cost-effective and environmentally safe disposal of discharged waters. Some farmers are calling for the government to install major arterial drainage systems to collect all waters drained off agricultural lands. On a related theme, proposals have been made to construct major regional engineering schemes to be fed by engineering works on agricultural land (eg. Belford 2001; Thomas and Williamson 2001). Again, further investigations are needed to assess the safety and cost-effectiveness of these approaches, which would have very high up-front costs.

Pumping is more likely to be a viable strategy where particularly valuable assets are at stake (e.g. the infrastructure of a town, or an important environmental asset).

In situations where a valuable asset is located in a catchment where the process of watertable rise is well advanced, the benefits of revegetating the catchment may be too little and too late to save the asset.

In these cases, pumping is probably the only strategy available with the technical capacity to protect the asset (Campbell et al. 2000). Pumping is a key part of a multi-pronged attempt to preserve Lake Toolibin, the last remaining freshwater lake in the Western Australian wheatbelt.

Pumping can be more effective in locations where it is able to access water from a paleochannel, which is a more permeable zone from which groundwaters can be extracted more easily than elsewhere. Some of the existing pumping to protect Lake Toolibin is accessing a paleochannel.

Identification of paleochannels is one aim of the airborne geophysics program of the National Action Plan for Salinity and Water Quality. Airborne geophysics has been used for a number of years in Western Australia. Attitudes to it among those with technical expertise vary. It seems likely that it has a contribution to make, but will fall short of playing the pivotal role envisaged by some.

6. In a regional groundwater flow system (e.g. a large, flat wheatbelt catchment), groundwaters may move slowly over long distances (e.g. greater that 10 km), crossing several farm boundaries before discharging lower in the landscape. At the other extreme, in local groundwater flow systems (e.g. in relatively undulating landscapes) recharge and discharge are likely to occur close enough together to be within the same farm (Pannell et al., 2001).

Finally, another approach currently being investigated is the use of "relief wells" which allow saline groundwaters to be discharged under pressure at the surface.

Overall, there is a new recognition and acceptance of the role of engineering works in managing groundwaters (as well as surface waters). There is, however, relatively little information available about their on-site and possible off-site impacts, and even less about their cost-effectiveness as broad strategies.

4.4 Living with salinity

As noted earlier, even with major interventions, continuing salinisation of resources will occur in Western Australia. If large-scale changes to farming practices are made immediately, the area of saline land would still increase by at least two million ha from current levels (around two million ha) before stabilising. The reason for this is that the salinisation processes already under way will take many years to reach equilibrium even if future recharge rates are reduced. Water which has been added to groundwaters over the past decades will continue to discharge over steadily larger areas in coming decades.

Farmers in Western Australia with large areas of salt-affected land are already trialing and implementing farming systems based on salt-tolerant plant species. These farmers are viewing saline land as a potentially productive resource, and are attempting to develop new ways to make use of it. There are a number of "halophytic" plants that will grow on saline land, and some are suitable for livestock forage. Lambs grazed on saltbush are said to have an enhanced flavour, which may provide marketing opportunities. Livestock industries are likely to be the major users of salt land, but a number of opportunities exist to develop new commercial uses for salt water, as identified through the "Options for the Productive Use of Salinity" study:

- Saline aquaculture is attracting growing interest. A number of farmers are already stocking salty dams with yearling trout.
- Saline water can be used for electricity generation, algae (eg. for agar, ß-carotene, pigments, or fish food), seaweed and, if it is not excessively saline, irrigation water.
- There is potential to process saline water to extract valuable salts and minerals, including magnesium, bromine and potassium chloride.

Where water resources are salinised, desalination as a form of "living with salinity" is an option which appears to warrant further investigation. The economics of desalinisation are more likely to be favoured if the water can be desalinated locally and substitute for water piped over considerable distances. Further, if prevention of salinisation of a water resource catchment involves very high costs, desalination may again be a cheaper method to obtain fresh water.

Other types of engineering methods to adapt to salinity may also be more efficient than salinity prevention. These potentially include engineering works for flood mitigation, and replacement of damaged infrastructure with structures designed to better withstand salinity.

Finally, an option available to landholders is to allow salinity to occur and to make do with smaller productive areas, perhaps with some intensification of production. In situations where treatments are expensive and/or slow to show benefits, and the assets at risk are not sufficiently valuable, such an option may conceivably be the most efficient course of action, not just for the farmer but also for society more generally.

4.5 Economics of salinity management

The economic costs and benefits of available salinity management options are important at two levels:

- At the farm level, they have a strong influence on the attractiveness of the management options to land managers; and
- At the catchment, regional or state level, they have an influence on the type of policy approaches and the scale of public investment which would be in the best interests of the community as a whole.

Where public funds are less than needed to fully address the problem, economic considerations influence the prioritisation of targets for public investment.

First consider the farm level. The hydrological modelling results presented earlier, combined with recent economic modelling results, have strong implications for use of perennials for salinity prevention. Unless the perennials used are almost as profitable as the farming enterprise they replace, they will usually not pay their way through salinity prevention. Where perennials are established, their on-farm economic benefits from salinity prevention are usually small relative to the direct and indirect costs of establishing the perennials. Therefore, in order to assess the potential for widespread adoption of perennials by landholders, it is essential to consider their economic costs and benefits other than salinity prevention.

The economic attractiveness to land managers of existing perennial options varies widely from location to location, and between different soil types or landforms within a location. Nevertheless it is possible to draw some broad conclusions about the economics of existing options.

In general, the existing perennial plant options for salinity prevention are economically attractive only on a scale that is much lower than we would need to effectively prevent salinity. All of the perennials listed earlier are attractive in certain situations, but all have significant limitations on their potential scale, including:

- requirements for particular soil types or soil conditions (eg. lucerne is susceptible to water logging and acidity);

- rainfall requirements (eg. blue gums require high rainfall); and
- market or processing limits (eg. the capacity for oil mallee production will be limited by the capacity of processing plants and the mallees will need to be grown sufficiently close to processing plants to avoid excessive transport costs).

The Cooperative Research Centre for Plant-Based Management of Dryland Salinity is a newly established national centre, with headquarters at the University of Western Australia. It will be attempting to develop new perennial options that are profitable for farmers to adopt. Given the observations above, this is clearly a task of outstanding importance.

The Cooperative Research Centre will also be addressing the need for additional options for profitable agricultural production on saline land. New salt-tolerant pasture and crop types will be developed. Given the inevitable increase in saline land, this is also a key task. Given the low value of saline land for alternative uses, the economics of these options for living with salinity (for "discharge" areas) are probably less challenging than those of perennials for salinity prevention (for "recharge" areas).

Successful development of both discharge and recharge commercial plant options will require more than research and development. Marketing, transport and processing issues will also be important, as will the involvement of farmers in participatory research to test and refine management systems for plant options as they become available.

As noted earlier, there is relatively little evidence about the farm-level economics of engineering options. Surface water management appears likely to be viable for farmers, particularly in cases where it reduces water logging problems, or provides fresh water for other productive uses. The farm-level economics of deep drains are likely to vary depending on their technical effectiveness in the local conditions. An economic analysis of deep open drains on agricultural land by Ferdowsian et al. (1997) reached negative conclusions about their cost effectiveness, but given recent farmer observations and new evidence that is emerging about their effectiveness in some situations, further research and analysis is needed.

In some cases, engineering works will be the most cost-effective method for protecting high value public assets, especially where processes of salinisation are well advanced. This is because of the technical effectiveness of engineering, but also because of the long lags in achieving catchment-scale benefits from revegetation.

However, it should not be presumed that engineering works would be economically viable, even in locations with high value assets at risk, such as threatened rural towns. It depends on a careful comparison of the benefits with the costs. Recent studies of engineering works for salinity prevention in six threatened rural towns reveal the challenges in making large-scale engineering interventions pay.

Case Study: The Rural Towns Program

Hydrologists recommend that the most important and effective treatment for preventing salinity damage within town sites is reducing recharge within the town site, and/or enhancing discharge in and around the town by engineering treatments, such as pumping (Matta, 1999; Dames and Moore - NRM 2001). It is believed that, in most cases, benefits from revegetation of surrounding farmland will be insufficient and/or too slow to prevent major damage to town infrastructure.

For towns such as Merredin, which have fresh water piped to them for domestic use, the problem is worsened by release of this imported water into the ground from garden irrigation systems or septic tanks. For some towns in Western Australia (eg. Cranbrook, Tambellup), imported water and runoff from roofs and roads accounts for a substantial part of the groundwater rise within the town.

The Rural Towns Program is concerned with 42 Western Australian towns facing salinity impacts. A number of these towns have been subjected to hydrological studies to identify systems of intervention which would be needed to reduce the impacts of salinity, and for six of them, detailed economic analyses of these interventions have been conducted. These are very important studies and they have major implications for the management of salinity in the towns. Some of the common findings from the six towns are listed below, drawn from the report by Dames and Moore - NRM (2001).

- In low-lying towns like Merredin and Katanning, groundwater beneath the towns has low rates of lateral flow through material of low transmissivity. Actions taken to reduce groundwater recharge higher in the catchment will have very little impact on groundwater behaviour beneath the town within time frames needed to prevent damage. The corollary is that actions to prevent groundwater rise or to lower existing levels need to occur within or immediately adjacent to the town site.
- Surface water management within the towns is inadequate. In some cases, observed damage

Table 3. Summary of economic analyses of salinity management for six towns in the Rural Towns Program

(timescale of estimates) **Town**	(years) **Timing of onset of major costs**	($ million) **Damage costs from salinity if no works undertaken**	($ million) **Total cost of possible works to control rising groundwater**	($ million) **Potential gain from engineering works**
Brookton (60 years)	4	0.62	0.28	0.34
Corrigin (60 years)	2	0.21	-0.10	0.31
Cranbrook (60 years)	22	0.61	2.3 to 5.7	-1.6 to -5.1
Katanning (30 years)	1	6.9	7.6	-0.74
Merredin (60 years)	26	0.38	1.8 to 4.6	-1.4 to -4.2
Morawa (30 years)	1	0.25	0.90	-0.65

(source: based on Dames and Moore - NRM (2001).

is being caused by poor domestic water management or a lack of sealed drainage, rather than rising groundwaters.

- Roads are the biggest cost item from salinity in the towns, amounting to about 60 per cent of the total.
- There is great variability in the situation in different towns. Towns need individual investigation and advice in determining the most appropriate course of action. Without specialist professional input, affected towns are unlikely to grasp the necessary approach to urban water management that is needed.

Some of the actions recommended by the consultants are cheap and could be taken up immediately (eg. appointment of "Water Wise" coordinators to provide advice to businesses, householders and builders). Nevertheless, preventing the rise of groundwaters in most of the towns will require expensive engineering works. In some of the towns, the cost of the recommended works is so high that it outweighs the potential salinity damage costs which would be avoided, implying that living with the salinity damage may be more economically efficient than attempting to prevent it. This is apparent in Table 3, which shows a summary of the economic analysis for each town. The costs shown are total costs over 30 or 60 years, discounted to present values using a 7 per cent discount rate.

The final column shows an estimate of the net benefits of strong intervention in the towns, based on an (possibly optimistic) assumption that it would result in prevention of all costs listed in the third column. In four of the six town, the economics of the engineering interventions studied appear adverse. The two positive results, Brookton and Corrigin, have the advantage of being able to make some valuable use of the pumped water hence the negative cost for Corrigin. Even in Katanning, which is probably the most salt-threatened town in Australia, the costs estimated for disposal of pumped saline water into lined evaporation ponds is so high that costs more than offset the benefits from salinity prevention. If it is difficult to economically justify lined evaporation basins to protect the extreme example of Katanning, it seems unlikely that this approach could pay off in any less extreme cases.

Care is needed in interpreting the result that engineering works for salinity prevention are not economically viable in several of the towns. It does not imply that the town's infrastructure should be left to deteriorate without any response. Rather it implies investment in Katanning will be more effective in repairing damage caused to infrastructure as a result of rising groundwater than to prevent that damage. Money would be spent on repairs, but in three of the towns, the cost of repairs would be approximately 25 per cent (or less) of the costs of preventing the damage.

The results highlight the importance of cheap disposal of saline pumped water, and should encourage investigation of potential safe and cheap alternatives. The positive economic results for Brookton and Corrigin suggest that making profitable uses of the water may be the key to making the engineering systems economically viable. It may be that continuing advances in desalination methods will make the pumping option attractive in more towns.

The Merredin town site is currently the subject of a major trial involving pumping of groundwater, desalination of a proportion of the water with the resulting fresh water substituting for piped water from Mundaring Dam, and disposal of saline effluent in a lined evaporation basin outside the town. Although prospects for a full-scale version of such a system to be viable in Merredin currently appear poor, much will be learnt in the trial that may improve those prospects either in Merredin or other towns.

A final aspect of the economics of salinity is the value of off-farm benefits and costs from on-farm salinity management. In principle, such off-farm benefits might be used to justify so-called "salinity credits". Such credits may be paid by the State to farmers as a reward/incentive for implementing salinity prevention measures. These may help to make the available management options more financially attractive to farmers.

The State Salinity Strategy has had a specific goal to investigate such an approach and the National Action Plan for Salinity and Water Quality also includes the investigation of "economic policy instruments" or "market-based instruments" such as salinity credits.

Economic policy instruments do, no doubt, have a role to play in promoting change on farms in some situations. However, recent developments in our understanding, as reflected in Figure 1 above, reveal that the potential benefits of economic policy instruments are likely to be a somewhat limited. The main benefits will be in a small proportion of locations where off-site benefits from on-farm revegetation are outstandingly high and groundwater systems are sufficiently responsive to on-farm management. For the majority of agricultural land, off-site benefits from revegetation are low (per ha of revegetation), or on-site costs are high, or both. In these situations, use of market-based instruments are unlikely to be effective in altering farm management on the scale needed for effectiveness against salinity, unless the incentives provided are greater than the off-site benefits. The use of such large incentives would actually worsen matters, rather than improve them, because they would encourage adoption of perennials in situations where the total costs (combining on-farm and off-farm) exceed the total benefits, including reduced salinity costs.

Situations where salinity credits or some related approach may be beneficial will normally be localised, specific cases. Examples might include water resource catchments (such as for the Wellington Dam), or farms upstream from outstanding environmental assets.

The Water and Rivers Commission has investigated economic instruments for use in the Wellington Dam catchment. They examined a range of types of economic instruments, indentifying differences in their practicality and distributional impacts. No discussio to change from the existing approach based on cost shaving has been made. For more diffuse public benefits (eg. prevention of flood risk, protection of small remnant areas of native vegetation on farms, protection of agricultural land) other approaches are needed. Expenditure of public funds at the level that would be required to fund credit schemes for those more diffuse benefits is unlikely to be in the community's best interest.

The observation that off-farm benefits from on-farm management are commonly small is related to the conclusion of hydrologists (reported earlier) that management of groundwaters within country towns primarily needs to focus on actions within the towns, rather than in the surrounding catchments. This results from the intrinsic properties of groundwater systems in our agricultural region. Even for some environmental assets, it may be that on-site action is the top priority for successful salinity prevention. The example of groundwater pumping from under Lake Toolibin is an illustration of this. Actions within the surrounding catchments will also provide benefits in such cases, but they will often be insufficient in scale, and too long in coming to be relied upon as the sole protective measure.

4.6 Social issues

The impacts of salinity in Western Australia are not confined to primary production, physical infrastructure and the environment. There will also be a number of social impacts, including influences on people's sense of community and sense of place. The State Salinity Strategy therefore needs to also acknowledge the 'social dimension', including individuals, groups and rural communities.

There will be social impacts both from salinity and from the treatments employed to manage salinity.

Most tangibly, the loss of income from salt-affected land will adversely affect the welfare of farmers and the communities where they shop and live. In extreme cases, salinity may mean that some farmers are forced to leave their properties. These impacts will be keenly felt by rural communities already fighting to maintain population and services. Loss of land to salinity will not be distributed evenly through the landscape, so that social impacts also will fall more heavily on some individuals (Frost and Marsh 2000).

Farmers place a high value on 'legacy' - the ability to hand on their property in good order to the next generation. With the ongoing spread of salinity, the loss of legacy value will be felt keenly by both individuals (Frost, 2000) and communities. Effects of salinity on rural infrastructure and environmental assets may have similar psychological impacts on people in rural towns. In the long run, impacts on population, prosperity, land prices, tourism potential and recreational resources are likely.

The establishing of new industries may also have social impacts, both negative and positive. For example, in some regions of the south-west, large areas of plantation forestry on farms has seen many land managers leave the district. Indeed, farm forestry appears to have had a greater impact on populations (at least locally) than salinity itself. It is less clear what the net effect on populations in a region will be, once the positive employment impacts associated with processing, transport and marketing service industries are fully felt. Similarly, new industries such

as aquaculture, wildflower production and tree nurseries have had positive social impacts through employment of local people in the operation of businesses.

Inevitably, views on management differ between farmers, rural town communities, urban communities and government agencies. Marsh et al. (2000) investigated attitudes of farmers, rural town and city populations to resource management issues in the Moore Catchment in Western Australia. The outcomes of various hypothetical water management options were described in terms of the area of salt-affected farm land, the area of farm land planted to trees, the impact on wetland ecologies, the risk of a major flood event, and changes in farmers' incomes. The authors concluded that the values and attitudes of the three groups vary widely, with very different emphases on agricultural and environmental benefits. Even within any one of the groups, the variations were substantial.

Findings such as this have implications for community acceptance of resource management strategies. As the prognosis for salinity becomes more widely known in the urban community, the effectiveness and orientation of past public investments in programs such as Landcare may be questioned. There is potential for disillusionment among those who have made major efforts to protect their local environments.

Most people acknowledge the need for a substantial and integrated response to salinity. The differing perceptions and values of people inevitably mean that it is sometimes difficult to reach consensus on what forms that response should take. Differing attitudes towards deep drains in rural communities today provide a current example.

Government policies for salinity rely very much on farmers to voluntarily adopt new farming practices to manage salinity. The speed and level of adoption of new practices depends on many factors, particularly on the interaction of economic and social factors.

A farmer's capacity to change depends on factors such as his or her economic resources, knowledge, time, family situation and the importance of non-agricultural income sources (Barr et al., 2000). Even where commercially viable treatments are available, social factors will play a role in their speed of uptake. The cohesiveness of farmer groups, the strength of information channels, and the credibility of information sources all play important roles in farmers' learning about and evaluation of new innovations.

What people said about the existing State Salinity Strategy & the Salinity Action Plan

"The Quairading Land Conservation District Committee was happy with the level of community awareness that was a result of the State Salinity Strategy. The group has applauded the Government's recognition of an integrated approach and its commitment to looking after the people of rural communities. The Quairading LCDC also supports the strategy in that landholders should learn to live with salinity and view saline areas as a resource on farms that needs greater utilitation."

Quairading LCDC

"Nyabing Pingrup LCDC has held two meetings where this submission was discussed... Of the people attending, only four had seen the Salinity Action Plan and only two had read it."

Nyabing Pingrup LCDC

"The Federation believes that the State Salinity Strategy and Action Plan has proved to be an integral component in the State's battle to manage salinity. The fact that WA is further advanced in its management of salinity than other States is clear evidence of the effectiveness of the strategy."

Western Australian Farmers' Federation

"One of the mysteries of the Salinity Action Plan and Strategy is the incontrovertible attitude taken by its proponents. Any criticism of "the plan" is roundly ignored and when well reasoned alternatives are put forward the only sound is the rustle of papers destined to the waste bin. In short, new solutions have not been welcomed."

Rod Bradley

"It should be clearly identified that the State Salinity Strategy and the Salinity Action Plan are a component of natural resource management and should be addressed in that manner."

Peel Harvey Catchment Council

"I am derisive of the attempt by this Government to change current thinking of salinity issues. There have been an awful lot of studies and recommendations but none have really taken the process anywhere. A complete overhaul of the whole structure, I believe, needs to be adopted. All the millions of dollars that have been spent in this State in salinity; what real purposes and achievements have emerged? All the monitoring and research projects; what is the summary of these results?"

John Hall

5. Findings and Recommendations

5.1 The Existing State Salinity Strategy and Salinity Action Plan

Term of Reference 1, in its entirety, required the Taskforce to review the strategies and actions of the Salinity Strategy 2000 and their implementation, paying special attention to a range of issues. Specific comments on these matters are made throughout the Taskforce Report.

The Taskforce considers that the strategic direction and actions stated in the Salinity Strategy 2000 are supported by the themes emerging throughout its review. However, the Taskforce considers that the points of emphasis have shifted and that a process for more strategic investment is required. Therefore, while the principles of the 1996 and 2000 Strategies remain relevant, the Taskforce has identified shifts in investment in a range of areas. On balance, the Taskforce considers that the sorts of changes in emphasis and direction that it is recommending, if accepted by Government, will alter the current Salinity Strategy and Action Plan.

A number of significant events have occurred since the Salinity Strategy 2000 were released including:

- announcement of the Government's new initiatives of demonstration catchments and testing of engineering solutions;
- the National Action Plan for Salinity and Water Quality;
- establishment of the Cooperative Research Centre for the Development of Plant-Based Solutions to Dryland Salinity;
- new information about the potential impacts of salinity, particularly on biodiversity and infrastructure; and
- new information about the requirements for effective salinity management.

These events, when considered together with the changes that the Taskforce is recommending, point to the need for the development of a new Salinity Strategy. In recommending this, however, the Taskforce is very aware of the significant effort and consultation that occurred to develop the Salinity Strategy 2000 and the effort that people have made to contribute to the Taskforce's own deliberations. The Taskforce therefore recommends that the new Strategy be prepared as a matter of urgency and with targeted consultation.

Recommendation 5.1.1

The Salinity Taskforce recommends that the proposed Natural Resource Management Council for Land and Water develops a new State Salinity Strategy to reflect the new investment priorities of the Government and any outcomes of negotiations for the National Action Plan for Salinity and Water Quality. The Strategy will build on the 1996 and 2000 Strategies by incorporating the findings of the Salinity Taskforce, particularly the need for increased attention to:

- *the completion and application of the Framework for Investment in Salinity Management;*
- *better systems for monitoring and evaluation;*
- *engineering methods for salinity management in suitable locations;*
- *commercial drivers and development of new technologies and farming systems for salinity management;*
- *new structures and institutional arrangements; and*
- *improved biodiversity management and protection.*

Recommendation 5.1.2

The Salinity Taskforce recommends that its statement of 'A New Position on Salinity Management' (Section 2) be endorsed and used as the basis for developing the new State Salinity Strategy as well as guiding the State's negotiations for the National Action Plan for Salinity and Water Quality and influencing negotiations for phase two of the Natural Heritage Trust.

Recommendation 5.1.3

The Salinity Taskforce recommends that the new Salinity Strategy incorporate interim outcomes, targets and milestones, based as far as possible on the proposed Framework for Investment in Salinity Management (see Recommendation 5.2.1).

Recommendation 5.1.4

The Salinity Taskforce recommends that, over time, outcomes, targets and milestones be refined as the Framework for Investment in Salinity Management is applied with greater detail and rigour to the range of investment options for salinity management.

Recommendation 5.1.5

The Salinity Taskforce recommends that the new Salinity Strategy be completed within six months of endorsement of the recommendations of the Salinity Taskforce.

What people said about prioritising salinity investment & monitoring effectiveness

"Government policy on dryland salinity needs to be much more responsive to scientific information and subject to regular review, taking into account scientific and technical developments."

Simon Abbott

"Considerable funds, largely derived from Telstra, have been all allocated to this problem with little if any impact upon it. It was clear early in the first phase of funding of this massive infusion of funds that the scenario of fund allocation would match the "honey pot" phenomenon and so be open to abuse by the more vigorous and/or favoured land holders, technocrats (both private and public) and politicians....It appears that most of the money has been spent on a scatter of farms, minor catchments and wetlands."

H. M. Churchward

"While the 2000 Salinity Strategy was a significant improvement on the 1996 Plan the Conservation Council was critical of the lack of actual strategic approach in the new Strategy. We are therefore strongly supportive of the development of the Priority Investment Framework. Once finalised, this should be applied to expenditure on all salinity and NRM issues."

Conservation Council of WA

"Monitoring and evaluation have been the Achilles heal of NRM and Salinity Strategies. We do not and cannot show clear advancement for the investment made. A more effective tool needs to be developed. The key will be the regional groups information networks using suitable software and well developed guidelines to capture levels of investment, past and present and its progress in success or failure with technical/social assessment in spatial reporting."

Mike McFarlane

"Fast track a salinity monitoring system capable of educating the public on the dangers and costs of salinity to the community as a whole. The community at Shire level should have regular information on parameters such as groundwater movements over time, stream and river salinities and rate of change of land salinisation over time. On a State basis this information should be published regularly in the media so that urban communities have some understanding of the problem."

JDS O'Connell

"In my experience, I consider that a more professional approach to monitoring these bores, together with the many other bores throughout the State is urgently required. This monitoring process includes information such as water table depth, water quality and quantity and general ground water pressure information. Monitoring of ground water is fundamental to the knowledge of saline land control because without the influence of saline ground water, there is no problem."

Soil Conservation Services

" The greatest difficulity for developing monitoring and evaluation processes for salinity change has been the lack of a process to measure biophysical and economic changes at any scale."

Avon Working Group

"If we can learn anything from our experiences with the decade of Landcare and the first five years of the Natural Heretage Trust, it is that we must not confuse activity with effectiveness."

Tom Hatton, CSIRO

5.2 Prioritising salinity investments and monitoring effectiveness

Section 2 outlines the Taskforce's general philosophy in relation to salinity management and explains why it considers that a strategic investment prioritisation framework is vital to future salinity management activities in Western Australia.

Term of Reference 5 required the Taskforce to review the process for prioritising the future expenditure of funds to combat salinity.

Term of Reference 6 required the Taskforce to review existing monitoring and evaluation arrangements and processes to:

- advise on appropriate social, economic and biophysical goals and targets;
- advise on how to determine whether strategies and projects are contributing to the targets and outcomes required;
- advise on how to ensure salinity funds are achieving positive change in priority areas on-the-ground; and
- ensure monitoring arrangements are adequate as the basis for annual and five-yearly reviews of the effectiveness of the Strategy in delivering relevant environmental and social outcomes.

This section considers both Terms of Reference. These interrelated activities should underpin all of Government's investment in salinity and the Taskforce has chosen to address these Terms of Reference early in its findings to emphasise how fundamental these activities are to future investment.

5.2.1 The process for prioritising future expenditure on salinity

The Taskforce considers that it is neither possible in practice nor desirable in principle for Government to provide direct financial assistance for the up-front and ongoing costs of on-ground works on the scale needed to manage salinity effectively across the agricultural region. As outlined in Section 2, the Government response needs to be catalytic and strategically directed with a careful process of prioritisation applied to funding.

The 1996 Salinity Action Plan and 2000 Salinity Strategy do encompass some prioritisation (particularly around public assets at risk of salinisation). However, the increased knowledge about salinity in recent years has highlighted the need for a more strategic and rigorous approach to allocating funding as small scale works will be ineffective in most of the areas at risk.

In recognising this, the State Salinity Council began developing a new Framework for Investment in Salinity Management (hereafter, the "Investment Framework") in October 2000 and the principles of this are listed below.

1. The top priority public investments are those which generate the greatest public benefits per dollar of public investment. Whether protection of a particular asset falls into this "top priority" category depends on the costs of preventative treatments, the effectiveness of the treatments and the values of the assets. "Values" include social and environmental values, as well as economic values.
2. Direct financial assistance to landholders to undertake salinity action should be strategic and should not exceed the public benefits that result. (i.e. focused on priority areas with high value and high probability of success).
3. Where the priority is high and net public benefits are sufficient, Government should be prepared to take strong action to ensure protection of the asset (e.g. compensation or structural adjustment, regulation and monitoring to ensure achievement).
4. Where the public priority is low but there are extensive private assets at risk, the public investment should be aimed at industry development (i.e. profitable systems to prevent or contain salinity or to adapt to saline land and water).
5. Inevitably, a targeted investment strategy in salinity management will result in an unequal distribution of investment across the state. Over time, funding priorities will change as new information becomes available and programs adapt, goals are met and new challenges arise.
6. Government must fulfil its statutory obligations for land, natural resources and functions (such as research) when it sets its priorities for investment in salinity action.

The Taskforce endorses these principles as forming a sound basis for investment prioritisation.

Although the Investment Framework is not yet finalised, the Taskforce considers that this is a very important initiative and that good progress has been made in its development.

The Taskforce concurs with the Salinity Council working group which has been developing this framework that a rigorous investment decision process for allocation of available resources needs to become part of the "Natural Resource Management culture" of the State with shared ownership across Government, Government departments and the community. With the allocation of scarce resources also comes the need to ensure funding decisions and processes are transparent and accountable with a clear statement of the assumptions used in the process.

The Taskforce expects that the Investment Framework will provide a sound basis for planning and

investment over the long term, but to be truly effective this will require endorsement of the Investment Framework by Government as the basis of resource allocation decisions in salinity management.

Existing regional Natural Resource Management strategies prepared by the Natural Resource Management Regional Groups do contain priorities, but in general they have not been derived using a formal prioritisation process of the kind represented by the Investment Framework.

In addition, existing regional strategies contain desired outcomes that are perhaps unrealistic given the limited resources available to achieve them. Given the emphasis in the National Action Plan for Salinity and Water Quality on funding delivery through natural resource management regional groups, it will be important that the these groups adopt a process of prioritisation for on-ground works that is more consistent with the Investment Framework.

However, meaningful application of the Investment Framework makes high demands for information and expertise, and so regional groups will need significant technical support from departments in applying the Investment Framework to their regional strategies.

A component of this support will be training in both the methodology and application of the process.

Such a process will also require coordination and continued development and review. The Salinity Taskforce considers that the proposed Natural Resource Management Council for Land and Water should lead this. Additional funding will be required to provide the specific data requirements for application of the framework.

Recommendation 5.2.1

The Salinity Taskforce recommends that the State Salinity Council's "Framework for Investment in Salinity Management" be finalised and that substantial additional funds be allocated to data collection and analysis to support the application of this framework in guiding priority setting for investment of public funds at State and regional levels. This process should be overseen by the proposed Natural Resource Management Council for Land and Water and coordinated by the proposed Natural Resource Management Office and involve the full range of relevant groups and departments, including natural resource management regional groups. The principles and assumptions behind the Investment Framework must be clearly articulated together with an explanation of its role in guiding investment decisions at the State and regional levels.

Later in this report, the Salinity Taskforce makes a number of specific recommendations for funding to particular activities. It has not been possible to subject these recommendations to detailed evaluation along the lines of the Investment Framework within the time and resources available to the Taskforce. The Taskforce acknowledges potential weakness in this, but has attempted to identify activities that it believes would clearly satisfy an Investment Framework analysis. Application of the Investment Framework to these recommendations as Government further considers them may be appropriate.

5.2.2 Monitoring and evaluation

The Taskforce considers that prioritisation of future expenditure on salinity (which largely determines the actions that are undertaken) and monitoring and evaluation are inextricably linked. In essence, the selection of specific programs of investment determines the monitoring and evaluation requirements, and ongoing monitoring and evaluation must inform future prioritisation of funding (as an input to the Investment Framework). Similarly, the framework used to prioritise salinity expenditure must also be kept under review.

For the purpose of this report, the Taskforce has defined monitoring to mean the collection of data and information over time. The Taskforce has defined evaluation to mean the interpretation and analysis of that information to determine if programs are meeting outcomes and targets and to allow improved decision making by managers. In the context of this report, the managers in question are policy and decision makers in Government and the community (e.g. Natural Resource Management Regional Groups).

It is important to note that monitoring and evaluation is also important for business managers, including farmers, but their monitoring and evaluation needs are somewhat different from those of policy makers, and are best dealt with within their own business management process.

In responding to Term of Reference 6, the Taskforce notes existing monitoring and evaluation activities, including the 2001 audit of outcomes of the Salinity Action Plan and Salinity Strategy conducted for the State Salinity Council by consultants URS Australia, and the 2001 internal review of programs by the Department of Conservation. While the Taskforce acknowledges the value of these initiatives, it is of the view that there is a need for a better designed and resourced monitoring and evaluation program for the whole of the Salinity Strategy. The purpose of the recommended program is to provide advice to the Ministers, the proposed Natural Resource Management Council for Land and Water, departments' Directors General and natural resource management regional groups to allow them to make decisions about resource allocation and continuation or cessation of programs or activities.

The Taskforce considers that monitoring and evaluation is not just a matter of accountability for

the expenditure of public funds; it is also needed to support the application of the Investment Framework in the medium to long term. A good monitoring and evaluation program will allow decisions on public investments to improve and be more responsive to evolving circumstances and new knowledge. It would also allow for continuous review and improvement of salinity strategies and projects within the Salinity Strategy.

There are three main components of a monitoring and evaluation framework:

- development of outcomes and targets;
- monitoring of appropriate indicators to provide measures of whether the targets and outcomes are being met; and
- evaluation, auditing, and reporting processes.

Background to these components is set out below.

The Taskforce considers that the Environmental Protection Authority is best placed to undertake the task of developing an improved monitoring and evaluation program, given its increased responsibilities arising from the Machinery of Government Taskforce recommendations.

Recommendation 5.2.2

The Salinity Taskforce recommends that substantial additional funds be provided each year to the Environmental Protection Authority to work with the proposed Natural Resource Management Office and the Departments of Agriculture, Conservation and Environment, Water and Catchment Protection to develop, coordinate and ensure the ongoing implementation of a comprehensive and cost-effective monitoring and evaluation program for salinity and natural resource management. The new program will, as far as possible, build on the existing monitoring and evaluation activities of State Government departments.

These resources provide for staff for the program and for purchase of monitoring and evaluation services from appropriate departments or commercial sources. The approach of providing resources to the Environmental Protection Authority to purchase monitoring and evaluation services is recommended for the following reasons:

- It will ensure that monitoring and evaluation are not neglected by departments.
- It will reveal the cost of monitoring and evaluation, which might otherwise be obscured within program budgets. This transparency will allow future decisions about the value of and appropriate investment in monitoring and evaluation.
- It will reduce the risk of conflict of interest, which can arise when departments are responsible for evaluating their own programs.

Appropriate Goals and Targets

Term of Reference 6.1 relating to the setting of outcomes and targets is addressed here.

In principle, appropriate targets should be an outcome of the application of the Investment Framework, in a process that involves full consultation with stakeholders. Targets would be the expected (i.e. most likely) outcomes of the selected set of salinity investments, with these outcomes having been identified by rigorous analysis, rather than being aspirational goals. In general, these targets will be based on future projections from computer modelling studies, or on insights gained from previous interventions in similar circumstances.

Recommendation 5.2.3

The Salinity Taskforce recommends that targets for the new State Salinity Strategy be developed as key outcomes of the application of the "Framework for Investment in Salinity Management".

These targets should:

- *specify the difference which will be made by the State Salinity Strategy in comparison to a scenario where there is no coordinated strategy and no additional funding;*
- *be expressed in terms of specific outcomes, including area of land protected from salinisation, area of saline land in productive use, value of infrastructure protected from salinity, number of species estimated to have been protected from extinction, area of native vegetation protected from salinisation and reduction in peak flood flows; and*
- *incorporate targets for community and social impacts such as increased employment in rural areas, prevention of rural population decline and increased wealth in rural areas.*

The above recommendation particularly relates to investments to protect specific public assets. For the industry development aspects of the Salinity Strategy, target levels of adoption of new land uses over time should be estimated as a means of focusing programs onto achievement of on-ground outcomes.

Recommendation 5.2.4

The Salinity Taskforce recommends that as new land use options become available targets for their adoption be established on the basis of analyses to determine realistic areas of adoption over time in view of:

- *areas of suitable soil types within suitable climatic zones;*
- *the expected economic performance of the new land use options relative to traditional land uses; and*
- *realistic adoption levels and adoption rates based on historical experience.*

Recommendation 5.2.5

The Salinity Taskforce recommends that targets be specified for research and development and industry development as a whole in terms of the potential levels of adoption of newly developed technologies and the actual aggregate levels of adoption of the technologies over time.

For the third broad element of the Salinity Strategy (planning, coordination and implementation of on-ground works), the setting of targets is likely to be a mixture of the two approaches outlined above. For elements of regional strategies that involve protection of specific identifiable assets, targets should represent the expected (most likely) outcomes of the programs, as determined in application of the Investment Framework (or similar) during development of the relevant regional natural resource management strategy. For elements that seek broad changes to achieve less site-specific benefits, targets should indicate potential and actual levels of adoption of the changes in question over time.

Targets under the National Action Plan for Salinity and Water Quality should be based on the State's targets established under the three approaches outlined above. The apparent intention of the National Action Plan is that targets for salinity outcomes will be established and investments rigorously assessed against them.

The Taskforce has some concerns about this aspect of the National Action Plan for Salinity and Water Quality. There is a twin danger that:

- genuinely realistic target outcomes for salinity prevention will be deemed as not sufficiently ambitious by those accrediting the proposed investments for the National Action Plan; and
- if more ambitious but unrealistic targets are set, the State will be subject to criticism for failing to meet them.

Monitoring arrangements

Here, the key elements of the monitoring component of the monitoring and evaluation program are discussed.

Recommendation 5.2.6

The Salinity Taskforce recommends that the monitoring and evaluation program for salinity and natural resource management include two broad monitoring components:

(a) Broadscale baseline monitoring of the impacts of salinity and the implementation of salinity management practices; and

(b) Monitoring to support evaluation of specific programs.

The broad-scale baseline monitoring aspect discerns time trends in variables such as stream salinity or the aggregate area of lands affected by or at risk of salinisation. This does not inform resourcing decisions in the same direct way as the monitoring of specific programs, but is valuable to the community and government as a general guide to progress in the Salinity Strategy. The State has most of the elements of a baseline monitoring program already, including:

- the Land Monitor project;
- monitoring of water table depths by the Department of Agriculture;
- monitoring of wetlands by the Department of Conservation; and
- stream gauging and monitoring of waters by the Department of Environment, Water and Catchment Protection.

However, with limited resources, ongoing allocations to these areas are not necessarily secure and may not be adequate.

Recommendation 5.2.7

The Salinity Taskforce recommends that substantial additional funds be allocated to continue the Land Monitor project in support of the statewide program of baseline monitoring.

Recommendation 5.2.8

The Salinity Taskforce recommends that the adequacy of existing baseline monitoring programs be reviewed by the proposed Natural Resource Management Office, together with the Departments of Conservation, Agriculture and Environment, Water and Catchment Protection. Any gaps or inefficiencies should be reported to the proposed Natural Resource Management Council for Land and Water and the Cabinet Standing Committee on Environmental Policy, with recommendations for improvement.

In designing the monitoring activities for specific programs, the information collected needs to provide the inputs to a formal evaluation.

Recommendation 5.2.9

The Salinity Taskforce recommends that monitoring be built into each program of the Salinity Strategy (including measurable targets over time) as an intrinsic part of the work, with a requirement that it will provide information for use in regular evaluations.

Evaluation

Terms of Reference 6.2 and 6.3 concern the determination of whether strategies and projects are contributing to targets and outcomes and how to ensure that funds are achieving positive change. That is, they relate to the evaluation of programs and of the Strategy as a whole.

Evaluation needs to be rigorous and to be carried out

by independent bodies at time intervals that are appropriate to the situation and the outcomes that have been agreed.

The Taskforce recognises that evaluations are expensive to conduct, so that their frequency and scope needs careful consideration. In addition, the value of conducting an evaluation depends very much on the willingness of program managers and policy makers to make changes in response. There needs to be a commitment by Government to view evaluations as an opportunity to improve programs where possible, rather than to justify existing activities.

A key aspect of evaluation is quantifying the link between on-ground actions and salinity outcomes. In general, this is a major challenge, particularly for strategies involving establishment of perennial plants. The diversity of hydrogeological circumstances and the very long lag times between action and off-site hydrological responses mean that the salinity-related benefits from the establishment of perennials are hard to predict and hard to observe. However, despite this difficulty, meaningful evaluations need to address this link. It will, in most instances, require advice from technical specialists, such as computer modellers.

Standard evaluation methods, such as Cost Benefit Analysis, are available, but not sufficiently used in natural resource management programs generally. A recent review of the Salinity Action Plan conducted by consultants URS Australia was informative, but the terms of reference for the review were not designed to allow improved decision making about future investments. The 2001 internal review of programs by the Department of Conservation provides a better model for this activity.

Recommendation 5.2.10

The Salinity Taskforce recommends that the new monitoring and evaluation program include development of formal and rigorous evaluation processes for salinity programs and identification of data requirements for such evaluations.

What people said about technology and industry development for salinity management

"Too many people see the salt scald as the problem, when lack of water use is the culprit. The only way we can be sure of adequate water use it to have perennials in the landscape. The options for these are not great. I submit that more of the salinity budget dollars are spent on research and development to find commercial perennial options and that guide lines for funding be broadened to help farmers move to these options."

Maurice Barnes

"Drainage is having success in some areas and will probably form part of the overall eventual strategies for addressing the problems of waterlogging and dryland salinity. There is no doubt that it will prove useful in many areas, that usefulness will only become apparent over the long term with examination of the results achieved to date in many areas."

Ferugson, Kenneison and Associates

"There is an urgent need to take a commercially oriented business planning approach to the salinity issue and in so doing involve corporations who could be expected to become key stakeholders in strategies which can commercially drive the management of salinity. Such corporations could be involved in: - short rotation perennial tree crops for dryland areas; breeding superior strains of perennial pastures; utilisation of existing saline situations. Approaching salinity as a business proposition will focus attention on the real issues which need addressing in economic, social and environmental terms.

Oil Mallee Company

"What is needed . . . is a change in attitude towards drainage. Drainage is used as a matter of course in agriculture in many parts of the world and yet for some reason Western Australia has yet to accept it as a vital part of our agricultural system. It seems somewhat strange that our government can accept that drainage can be used to lower the water table in the city...and yet not see the urgent need to drain the excess water from our agricultural areas. It is the current attitude towards drainage that has held back a serious assessment of engineering options to combat salinity."

Salinity Drainage and Management Association Inc.

"Little has been done to develop natural cropping systems other than timber plantations in high rainfall areas, oil mallees or small niche products such as sandalwood and ti trees. Research and development should be encouraged to develop end products such as bio-fuel oil, pharmaceutical products, industrial products and perhaps high value timber for longer term applications in certain areas of the landscape. These systems must be more profitable than current cropping options to encourage broad scale adoption."

Hyden-Kalgarin LCDC

"AGWA should have more funding to help farmers set up trials, possible long-term trials to research different and new methods in combating salt.

Wyalkatchem LCDC

"Eventually a way must be found to get industry to drive the salinity problem or solution."

Liebe Group

"In the short to medium term engineering solutions (drainage) provide the only effective tool to limit the effects of salinity, while plant based solutions and high water use systems are developed (in the long term). It is the role of Government to provide research for viable solutions and extension to bring these research results to farmers through implementation. Demonstration sites to give farmers confidence that solutions do work will be necessary."

JDS O'Connell

5.3 Technology and industry development for salinity management

The Salinity Taskforce considers that research and development continues to play a vital role, particularly in providing new options for salinity management. Research and development must be well supported, most importantly in the areas of engineering solutions, development of perennials and the use of salt land and salt water.

The Salinity Taskforce also considers, however, that research and development alone is not sufficient. Significant additional resources and effort must be directed to the development of commercially viable industries that build on these technical solutions and this must be done with close involvement, of farmer research and development and industry groups that are emerging in Western Australia.

In making recommendations in this area the Taskforce is responding to three Terms of Reference:

- Term of Reference 1.5 - progress in the development of new solutions including the level of support to development programs;
- Term of Reference 1.2 - progress in assessing the feasibility of engineering options; and
- Term of Reference 1.4 - the potential role of industry and research and development groups in salinity management.

Existing plant-based options available to farmers are viable only on a scale that is small relative to the scale needed to address the salinity problem effectively.

The farmers of Western Australia are recognised for their high level of innovation, and their creative and practical responses to salinity.

However, the task is too great and too complex to expect farmers to be able to create the necessary technologies without substantial research and development and support from Government in developing new regional industries and markets based on new technologies (e.g. bio-fuels from woody perennials).

Both the 1996 Salinity Action Plan and the Salinity Strategy 2000 acknowledged the importance of developing management options and solutions to salinity management.

The 1996 Action Plan discussed research and development needs for commercial tree crops and for higher water use by crops and pastures but no additional funding was provided in either area. New funding for "commercial industry development" for deep-rooted perennials was stated to be $11.0 million per year and this sum was to be sought from the Commonwealth. Funds received under the Natural Heritage Trust were significantly less than this.

The Salinity Strategy 2000 broadened the scope of potential management actions, acknowledging the need for additional activity in warm season cropping, perennial pastures, productive salt-tolerant plants and productive uses of saline water, as well as reiterating the importance of commercial shrub and tree crops. Again, however, no additional State funding was provided for research and development or industry development in these areas.

The Taskforce acknowledges the contributions of several research and development organisations at the national level, including:

- the Joint Venture Agroforestry Program of the Rural Industries Research and Development Corporation;
- the National Dryland Salinity Program;
- the Grains Research and Development Corporation;
- Land and Water Australia; and
- CSIRO.

Nevertheless, the Taskforce considers that, overall, the ongoing investment in development of new solutions has been very low relative to the level needed. Most past research and development for salinity has focussed on understanding and measuring the problem, rather than developing new management options.

Of the three areas identified in Section 2, the Taskforce considers that the development of new viable agricultural industries that will assist in managing salinity is the most important funding gap for Western Australia and this aspect also requires national recognition and support. The newly established Cooperative Research Centre for Plant-Based Management of Dryland Salinity is a very positive development, but the Taskforce considers that further investment in this area is required.

The Taskforce acknowledges the important role to be played by community-based groups involved in participatory research, development and extension, including the Western Australian No-Till Farmers Association, the WA Lucerne Grower's, the Oil Mallee Association, the Saltland Pastures Association and the Salinity Drainage and Management Association.

Recommendation 5.3.1

T*he Salinity Taskforce recommends a very substantial increase in annual funding for the development of economically viable new salinity management technologies and the establishment of new industries and markets based on those technologies, subject to evaluation of economic feasibility. This initiative should be pursued in close partnership with community-based groups involved in participatory research, development and extension.*

The State Salinity Council established a Research and Development Technical Committee to advise on

technical matters, coordinate research activities across institutions and oversee the prioritisation of research and development in Western Australia.

Recommendation 5.3.2

The Salinity Taskforce recommends that the Research and Development Technical Committee continue its current role under the proposed Natural Resouce Management Council for Land and Water.

5.3.1 Progress with engineering options

The Salinity Taskforce acknowledges the increasingly important contribution that engineering options will make to the management of salinity in Western Australia, particularly where urgent and localised action will be required to prevent further salinisation of high value assets. Relevant engineering methods will likely include deep drains, pumping, siphoning, relief wells, evaporation basins, arterial drainage and surface water management.

In responding to this Term of Reference, the Taskforce also acknowledges the progress that has been made to date, by Government departments and others, in researching the feasibility of engineering solutions to salinity management. Research recently commenced by CSIRO appears particularly helpful and important. In addition, a Deep Drainage Taskforce reported in March 2000 (''Deep Drainage in South-west Western Australia: Making it Work, not Proving it Wrong'') with a comprehensive review of the issue and 11 recommendations. The Salinity Taskforce considers that these recommendations remain relevant.

However, the Salinity Taskforce is also very well aware of the strong views expressed by farmers who advocate engineering solutions, particularly deep drainage, as a solution to salinity and who have criticised the lack of Government leadership in this area. The Taskforce therefore considers that existing community concern and uncertainty about engineering options, particularly deep drains, needs to be resolved as soon as possible and increased effort is required to progress this area.

The existing diversity of views within the farming and scientific communities and the lack of technical knowledge needed to evaluate potential downstream impacts from engineering works (including flood risk and environmental impacts) makes it impossible to support implementation of major engineering schemes in the short term. The current Government initiative on engineering investigations is therefore very timely and important.

In particular, the Taskforce considers that the preliminary directions that have been proposed for the engineering investigations through the Government's 'Engineering Advisory Committee' initiative do address the key areas of need.

As well as investigations to demonstrate where engineering options will work best, the options chosen for particular situations should be integrated as far as possible with other management measures such as surface water management, perennial pastures and tree cropping. In this way successful engineering options can be matched with other management options to demonstrate an integrated approach to managing rising water tables and salinity. For example, engineering measures could be part of a demonstration catchment, or built into existing trials or demonstrations for other management options.

Resolving engineering issues should involve:

- carrying out generic analyses of the feasibility of engineering options;
- identifying likely sites where engineering options may be cost-effective, environmentally acceptable and socially acceptable;
- undertaking specific studies on prospective sites judged to be most likely to succeed;
- developing cost-sharing principles (based on a beneficiary pays approach) for land managers with a stake in those particular areas; and
- monitoring the impacts and evaluating the results if a decision is made to proceed.

The Taskforce has made a number of recommendations to progress further the development of engineering solutions to salinity as a matter of urgency.

Recommendation 5.3.3

The Salinity Taskforce supports the current directions proposed for the $4 million engineering investigation initiative and recommends that it be implemented without delay, in close collaboration with CSIRO.

Recommendation 5.3.4

The Salinity Taskforce supports the proposed establishment of a broad-based advisory committee to oversee the engineering investigation initiative and recommends the close involvement and participation of farmer groups (e.g. Salinity Drainage and Management Association), contractors, Government departments, research and development organisations and natural resource management regional groups.

Recommendation 5.3.5

The Salinity Taskforce recommends that the aims of the engineering investigations include:

- *resolving technical uncertainties about effectiveness and cost-effectiveness of different engineering options in different situations;*
- *advising on practical design of engineering options;*
- *addressing regional drainage planning which minimises adverse downstream impacts and advances the potential to identify situations where downstream impacts from drainage are or*

are not acceptable (including issues of concern to indigenous groups, waterways management authorities and environmental organisations);

- *defining the role of Government in any such schemes (consistent with the principles of the Investment Framework);*
- *resolving equity issues, e.g. providing a sound basis for decisions about which catchments will and will not receive funding for drainage schemes (again the Investment Framework principles are relevant); and*
- *providing advice on how to resolve and simplify notification and approval procedures for landowners who propose engineering options.*

To allow us to forecast credibly the future state of wheatbelt rivers, in terms of flood peaks, salt loads and flows, including the impact of any large-scale revegetation or engineering works, there is a need for an improved modelling and analysis tool.

Once developed and evaluated the model should be able to be used to determine new 100-year flood levels for all wheatbelt drainage systems. This information will help to determine public and private assets at risk and to evaluate the benefits and costs of flood mitigation measures.

Recommendation 5.3.6

The Salinity Taskforce recommends that additional funds be allocated to the CSIRO and Department of Environment, Water and Catchment Protection towards the development of a modelling tool to allow improved analysis of flood peaks, salt loads and flows, including the impact of any large-scale revegetation or engineering works, and for application and testing of this model to at least one major basin, in conjunction with the engineering investigation initiative.

The existing approval process for engineering works, which places the onus on landowners to prove that downstream impacts are acceptable, is reasonable in principle but problematic in practice. In a context where deep drains are seen by many as an urgent need and are being installed at a rapid rate and where the process of assessing downstream impacts is difficult and expensive, the existing process will result in many landowners bypassing the approval process.

Recommendation 5.3.7

The Salinity Taskforce recommends that the Department of Environment, Water and Catchment Protection, with other appropriate agencies, develops a system of cost sharing for evaluation of drainage proposals.

A number of submissions to the Taskforce emphasised the benefits of large-scale arterial drainage to transport unwanted water from the wheatbelt to the ocean or into evaporation basins. Some work has been done to show how such systems could work. However, the State needs the capacity to judge whether such proposals should be subjected to pre-feasibility or full feasibility analysis.

Recommendation 5.3.8

The Salinity Taskforce recommends that the 'engineering options advisory committee' consider the need for pre-feasibility analyses of specific proposals for large-scale arterial drainage systems in the wheatbelt, and advise the Department of Environment, Water and Catchment Protection of the need for such analyses.

The crossing of roads and rail lines by drainage systems is expensive. A number of farmers raised concerns about unwillingness or inability of relevant authorities to provide for such crossings.

Recommendation 5.3.9

The Salinity Taskforce recommends that the Department of Planning and Infrastructure, Western Australian Government Railways Commission and the Western Australian Local Government Association develop a system of cost sharing for crossing of roads and rail lines by drainage waters for situations where the drainage system is assessed as being cost effective and downstream impacts of drainage systems are found to be acceptable.

5.3.2 Perennials to prevent salinisation

A range of new profitable perennials is needed to provide a sufficient range of choices for different physical environments and different farming systems. Significant progress has been made with the establishment of maritime pines and oil mallees in the lower to medium rainfall areas through the work of the Department of Conservation and the Forest Products Commission.

New commercial industries will be based on woody perennials, perennial pastures and, if possible, perennial crops. Perennials based on native species will ensure adaptation to local conditions and reduce risks of introducing new woody weeds. Success in developing industries based on woody perennials would generate the greatest range of benefits, but is also likely to be more difficult to achieve and take longer to realise benefits relative to herbacious perennials.

The process of successful industry development from new perennial plants is complex, multifaceted and inherently risky. The Taskforce commends the Department of Conservation for its comprehensive and well-conceived approach to new industry development, involving:

- the search for prospective perennial species and products;
- pre-feasibility analysis to identify a shortlist of best prospects;

- industry exploration to plan and commence building the foundation for an industry; and
- full feasibility investigation to prepare business and industry plans.

Consideration of market prospects for products is included throughout the process and guides all assessments of feasibility. A key requirement for new industries is large markets for the products, given the very large areas that need to be planted to address salinity successfully. The Forest Products Commission performs a vital role in this area. Prospective products include bioenergy, biofuels, wood particle products, activated carbon and eucalyptus oil and structural timbers.

To summarise this vision, development of new agricultural industries should be a central part of regional development as a new route to natural resource management and sustainable development.

Given the importance and difficulty of this set of tasks, the Taskforce considers that a 'Development Plan for New Regional Industries' should be prepared.

Recommendation 5.3.10

The Salinity Taskforce recommends that the Department of Local Government and Regional Development provide leadership in preparing a 'Development Plan for New Regional Industries' in collaboration with the Forest Products Commission, natural resources managment departments, natural resource management regional groups, regional plantation committees, local governments, Regional Development Commissions, natural resource management departments, Western Power, the proposed Natural Resource Management Office, research and development institutions, farmer industry groups, existing relevant businesses, environmental interests and farmer organisations.

Issues to be addressed in the Plan would include:

- *requirements to reconfigure the electricity grid to accommodate dispersed generation;*
- *the reconfiguration of regional water supplies to take desalinated water produced from cogeneration plants (joint electricity/desalination plants);*
- *the potential for ethanol mixtures in fuels and the potential need to modify transport fuels infrastructure accordingly;*
- *secure long-term funding sources for the large research and development task to support these initiatives;*
- *the achievement of natural resource management outcomes, including salinity; and*
- *benefits to the farming community and rural towns.*

Recently, new fuel quality standards have been imposed by Commonwealth legislation that limits or excludes access to traditional octane-enhancing additives such as benzene and MTBE. Ethanol produced from wood or other plant products is the most likely product to replace these newly-excluded additives, and this provides a major opportunity for stimulating woody perennial industries and processing plants over the agricultural region of Western Australia. Requirements for this to succeed would be one of the key issues to be addressed within the 'Development Plan for New Regional Industries'.

In the shorter term, the best prospects for wide adoption of new types of perennials are herbaceous perennials for grazing by livestock. Because of their compatibility with existing farming practices and the existence of markets for livestock products, perennial pastures are likely to be taken up rapidly by farmers, provided they are sufficiently profitable.

The Cooperative Research Centre for Plant-Based Management of Dryland Salinity has a key role to play in coordinating and delivering research and development in plant-based management of salinity (for both salinity prevention and productive use of salt land, which is discussed below). Although the Cooperative Research Centre is a welcome new initiative in this area, its resources are spread across the nation, and the level of resources available to be allocated to generating new plant-based options for Western Australia are not sufficient, given the magnitude of the task. In particular, the provision of funds for identification and development of germplasm would significantly enhance the Cooperative Research Centre's capacity.

The following recommendations address short-term needs in these areas. Over the long term, significant funding will be needed for similar initiatives. This should be addressed in the Development Plan for New Regional Industries.

Recommendation 5.3.11

The Salinity Taskforce recommends that substantial additional funds be allocated to the Department of Agriculture each year to enhance the germplasm development of perennial pastures, in collaboration with the Cooperative Research Centre for Plant-Based Management of Dryland Salinity.

Recommendation 5.3.12

The Salinity Taskforce recommends that substantial additional funds be allocated to the Department of Conservation over two years for research and development to establish industries based on Acacia species, including selection of specific species based on their suitability for production of wood products and/or feed in collaboration with the Cooperative Research Centre for Plant-Based Management of Dryland Salinity.

In addition, beyond research and development, funding is needed to support market research, development of processing technologies,

identification of the marketable attributes of specific products, feasibility studies, infrastructure, demonstration processing plants and so on.

Recommendation 5.3.13

The Salinity Taskforce recommends substantial additional funds be allocated for product testing and development for eucalyptus oils derived from oil mallees and other eucalypt species, to be administered by the Department of Conservation.

In the short term, difficult seasonal conditions in 2000 and 2001 have affected the impetus of oil mallee plantings. There is a high probability of greatly reduced plantings in 2002, which would adversely affect the organisations that both rely on and support continued expansion of the industry. Given that oil mallee is by far the best prospect for large commercial plantings of woody perennials in the short term, support for 2002 plantings would help to sustain the momentum and the health of the industry.

Recommendation 5.3.14

The Salinity Taskforce recognises the adverse impact of seasonal conditions in 2001 on the ongoing development of the oil mallee industry and recommends the provision of substantial additional funds to encourage continued plantings during 2002.

5.3.3 Productive use of saline land and saline water

The area of salt land and volume of saline water will continue to increase, so it is important to view these as potentially productive resources. In the evolution of the 1996 Salinity Action Plan to the Salinity Strategy 2000, there has been an increase in recognition of this area but still greater emphasis is justified.

The Cooperative Research Centre for Plant-Based Management of Dryland Salinity is providing an increased research and development effort. In addition, the Animal Production from Saline Land Systems Initiative lead by CSIRO Livestock Industries is addressing the animal production aspects of saltland pastures. This initiative is in the process of forging close links with the Cooperative Research Centre. The Cooperative Research Centre and the initiative will be working with the small existing program in the Department of Agriculture and with the Saltland Pastures Association, to demonst rate and encourage uptake through participatory research.

Existing and anticipated funding programs for saltland pastures are focusing on promotion of existing plant types and investigating their utilisation by livestock. There remains a relative weakness in funding for research and development to improve germplasm for salt land, and to develop new types of commercial salt-tolerant plants. New funding initiatives in saltland pastures are being discussed by national research and development funders. It is unclear whether they will address the existing weakness in the development of new germplasm. Increasing the effort in this area is limited by the availability of relevant scientific expertise, which reflects past funding neglect of the area. Therefore any increase needs to be modest initially and scaled up over several years.

Recommendation 5.3.15

The Salinity Taskforce recommends that substantial additional funds increasing over time are needed for research and development to improve germplasm for salt land and to develop new types of commercial salt-tolerant plants. National research and development funds should be sought for this purpose by the Department of Agriculture in collaboration with the Cooperative Research Centre for Plant-Based Management of Dryland Salinity, supplemented by additional State funds if necessary.

As part of the National Dryland Salinity Program, an initiative known as Options for the Productive Use of Salinity has identified a wide range of potential uses of salt water. Options identified in this initiative's database include aquaculture, electricity generation, irrigation with brackish water, algae (e.g. for agar, ß-carotene, pigments, fish food), seaweed, and extraction of valuable salts and minerals (e.g. magnesium, bromine, potassium chloride). The commercial potential for most of these options has not been explored in Western Australia.

Recommendation 5.3.16

The Salinity Taskforce recommends that additional funds be allocated to the Department of Agriculture to establish a program to evaluate the commercial potential of options identified by the Options for the Productive Use of Salinity project for making productive use of salt water in collaboration with the Department of Local Government and Regional Development.

The option which is most advanced at this stage is saline aquaculture. The Taskforce considers that this could be better integrated between the Department of Fisheries and the Department of Agriculture to promote development of this industry as well as a closer working relationship with the Western Inland Fisheries Co-operative and other relevant grower groups, and additional resourcing of saline aquaculture activities within the Department of Fisheries.

Recommendation 5.3.17

The Salinity Taskforce recommends that additional funds be allocated to the Department of Fisheries to further develop inland saline aquaculture industries and to develop a coordinated approach to industry development involving the Department of Agriculture, the Western Inland Fisheries Co-operative and other relevant grower groups.

5.3.4 Industry and research and development groups

Term of Reference 1.4 requires the Taskforce to consider the potential role of industry and research and development groups in salinity management. The

role of research and development organisations has been outlined above. In this section, the role of farmer and community groups involved in participatory research and development and industry development is addressed.

There are several types of groups relevant here. Firstly, there are groups with a focus on a particular industry, such as WA Lucerne Growers, the Oil Mallee Association or the Saltland Pastures Association (referred to below as "farmer industry groups"). Secondly, there are groups focusing more broadly on productive and sustainable farming systems, such as the Liebe Group and the Esperance Regional Forum (referred to as "farming systems groups"). Thirdly, there are catchment groups, who will also benefit from involvement in the development of new perennial options.

The Salinity Taskforce supports the intent of the Salinity Strategy 2000 in attempting to involve farmer groups more closely in developing solutions for salinity management. The Taskforce considers that farmer groups have a key role to play in testing, improving, demonstrating, and communicating the new management options as they develop. Such groups should continue to be fostered and supported in these activities.

Recommendation 5.3.18

The Salinity Taskforce recommends that research and development organisations support and work closely with farmer groups in participatory research to demonstrate and test engineering options, new perennial options and technologies for productive use of salt land and salt water. The 'Development Plan for New Regional Industries' should be used as a means to create partnerships between Government departments, other research and development organisations, farmer groups (such as the Oil Mallee Association, the Saltland Pastures Association and WA Lucerne Growers), non-agricultural businesses and natural resource management regional groups.

The Department of Agriculture has a key role in this. It has historically provided strong support to Catchment Groups. The Taskforce considers that the growing strength of farmer industry groups and farming system groups is a very important development and that the Department of Agriculture should continue to form strong supportive links with these new groups.

Recommendation 5.3.19

The Salinity Taskforce recommends that the Department of Agriculture give priority to maintaining linkages with and support for the emerging farmer groups which are focusing on a particular industry (e.g. lucerne, oil mallees, saltland pastures) or on productive and sustainable farming systems generally (e.g. WA No-Till Farmers Association).

What people said about community support, capacity building & mechanisms to encourage change

"The emphasis on catchment action being essential is so strong that individuals are likely to feel that there is little point in them acting alone. This is certainly not true as demonstrated by various members of the Saltland Pastures Association who have made their saltland productive, lowered groundwater levels, controlled erosion, mitigated flooding, improved habitat and reduced nutrient flow to streams without catchment plans being in place."

Clive Malcolm

"The emphasis on community capacity building is misguided and is attempting to solve the wrong problem. Most of the funding to this area should be redirected into the development of potential solutions for salinity."

Olsen and Vickery

"Doing agriculture differently must involve changes to the way people do business and manage their activities. Therefore, doing agriculture differently is about managing people - people will be responsible for introducing change and will have to adapt. Our approach to salinity must focus a lot more attention and resources on people, eg. information provision and management, decision making, social support, human resources, investigation into behavioural change, community support officers. So large scale investment is needed into social aspects of salinity."

Conservation Council of WA

"To gain the best outcome for limited investment dollars, both public and private, a clearer and more prescriptive solution to salinity needs to be provided by agencies with well resourced technical personnel and extension staff. This would overcome much of the "silver bullet" or last ditch emotional expenditure on solutions of dubious value being implemented at present."

Western Australian Farmers Federation

"Informing or educating urban communities about regional salinity and natural resource management issues, their complexity and their impact on the state's economic, social and environmental well-being should be a priority project for state salinity funding. Government will need broad-based community and electoral support to commit the resources required to address the issues."

Alcoa World Alumina Australia

"The element so far untapped is the human determination. Time and again people have striven and succeeded in the face of overwhelming adversity. We can do it again by setting our hearts and hands to the tasks of getting on and fixing the problem of salinity. But ordinary people need support and encouragement, a nucleus to work around."

Men of the Trees

"Ongoing funding for Community Landcare Coordinators is the first priority for governments in NRM at all levels. Local Government has a high capacity for the employment of professionals through administration and personnel management arrangements and the power of legislation through the Local Government Act."

Yilgarn LCDC

"There is a great wealth of knowledge and ability in the rural community - and our experience with the funded co-ordinators is that after 3 years they have the required expertise we need and they leave"

West Ballidu LCDC

"The recent Rapid Catchment Appraisal done in our LCDC this year appears to be very short on specifics to that catchment and provides little use to the landholders concerned other than a collection of data from other sources. There is a need for more hydrologists and the support to make them useful."

Hyden Kalgarin LCDC

"You will have some farmers beavering away to fit the guidelines, just to get the money - others who can see no net benefit to their sustainable landuse are just turning their backs and walking away."

John McDougall

5.4 Community support, capacity building and mechanisms to encourage change

Term of Reference 1.7 required the Salinity Taskforce to review the State Salinity Strategy to advise on mechanisms to encourage adoption of improvements in land management practices and to discourage continuation of inappropriate land management practices. Term of Reference 1.1 similarly required the Taskforce to review the Salinity Strategy and Action Plan paying special attention to community support and capacity building.

The Taskforce considers that these Terms of Reference are closely related; indeed that community support and capacity building is one of the primary ways of encouraging adoption of new land management practices and so both are considered in this section.

The farming community is very often a key source of new ideas, innovations and initiatives. Farmers' passion and commitment to management of salinity and other natural resource management issues revealed in public meetings and written submissions has impressed the Salinity Taskforce. The great majority of farmers are clearly highly motivated to address salinity, within the context of having to maintain a viable farming business.

The Government and the wider community need to acknowledge the substantial contributions already made by the farming community and to recognise how very difficult and expensive the remaining task will be. Following from this is recognition of the need for appropriate assistance. The over-riding philosophy of the Taskforce has been to create opportunities, which are jointly positive for the community, the environment, and the economy. Substantial changes in current farming practices and land use will be part of this.

Direct contributions to salinity management will also increasingly be required from non-farmers, particularly from residents of rural towns. Another important element, which is often forgotten, is working with Aboriginal people who are the original custodians of the land and have maintained a very strong interest in its good management. This aspect is brought together below as part of 'community support' rather than have it dispersed through the report.

There are several types of Government action that can help to promote and support the needed changes, including:

- research and development of various types, but particularly that targeted to create new land use options which are profitable in their own right, as well as being beneficial for salinity management;
- other support for new industry development, including support related to marketing, infrastructure, finance and processing;
- extension, including delivery of technical information, and support and facilitation of farmer groups involved in salinity management;
- economic policy instruments, such as subsidies, taxes, tradeable salinity permits, cost-sharing, and auction-based systems; and
- regulation to constrain inappropriate land uses and farming practices.

The first two of these categories have been discussed in the previous section. This section examines the other three categories, and includes a discussion of major relevant Commonwealth Government programs.

5.4.1 Extension

For the purposes of this report, extension is broadly defined to include public and private sector activities relating to technology transfer, education, attitude change, human resource development and dissemination and collection of information. It includes off-farm as well as on-farm participants in agricultural industries.

The Taskforce considers that salinity management into the long term is highly dependent on the commitment, innovation and action of individuals and groups in the community and that good extension activities are therefore very important.

Good extension activities will contribute substantially to the following critical requirements for engagement of the community in salinity management:

- Awareness of technical and scientific aspects of salinity;
- Awareness of likely economic, social and environmental impacts of salinity and of options for salinity management;
- A community which is knowledgable and skilful in the application of salinity management practices; and
- Involvement of community groups and individuals in decision-making, planning and action for natural resource management.

The Taskforce considers that it is also important to recognise the limitations of extension in promoting change. The experience of the Decade of Landcare reinforces the findings of social researchers that even excellent programs of awareness-raising, information provision and improved social processes may not be sufficient to induce large-scale changes involving great expense and high complexity. In particular, in relation to salinity the Taskforce has noted the serious neglect of technology development and industry development to provide land managers with systems that are economically viable on the scale needed to manage salinity. In general the appropriate role for extension is in the promotion of technologies which are already effective and economically viable, or

advancing the participation of landholders in research and development of such technologies.

The following sections address key extension-related issues that have been raised with the Taskforce.

Information and technology transfer

Information is critical to increase the capacity of individuals to review both the positive and negative impacts of their management decisions and to make new decisions accordingly. A number of submissions called for improved access to technical data and management information by community groups and individuals.

The extension services of the departments, particularly the Department of Agriculture, are well established and have considerable capacity to provide technical support to farmers and farmer groups. Bushcare Officers from both the Department of Conservation and Greening Australia, Western Australia, are another established source of technical information. Community Landcare Coordinators are also highly valued by farmers. For various reasons, their roles have most commonly been in coordination and planning, rather than technology transfer, but the Taskforce considers that improving technical capacity of Community Landcare Coordinators is important, and makes recommendations below regarding tenure and training to advance this.

Recommendation 5.4.1

The Salinity Taskforce recommends that the Departments of Agriculture, Conservation and Environment Water and Catchment Protection continue to develop resource information kits to increase awareness of available salinity management options, highlighting circumstances where these options are considered to be economically viable. It is recommended that the information in these resource kits be targeted to enable individuals to better identify and implement appropriate and cost-effective activities and review the outcomes of these activities.

Recommendation 5.4.2

The Salinity Taskforce recommends that the Department of Conservation and Greening Australia, Western Australia continue to develop information resource kits to increase awareness of the richness of biodiversity in Western Australia. The kits should include information to facilitate monitoring and management of this biodiversity by community groups.

Scientific studies conducted under the Salinity Action Plan and Salinity Strategy have provided the State with much improved information about the current and potential future impacts of salinity. The Land Monitor project is a key example. Recommendation 5.2.7 supports the continuation of the Land Monitor project.

The Taskforce sees an increased role for dissemination of information by natural resource management regional groups, particularly under the auspices of the National Action Plan for Salinity and Water Quality. Some regional groups have already undertaken initiatives in this area.

Recommendation 5.4.3

The Salinity Taskforce recommends that the communication processes and networks of natural resource management regional groups be further developed with support from the National Action Plan for Salinity and Water Quality. The proposed Natural Resource Management Office should support this work along with the natural resource management government departments.

A key initiative of the Salinity Strategy 2000 is the Rapid Catchment Appraisal program. This grew out of concerns that the Focus Catchment process of the 1996 Salinity Strategy was not working effectively in all regions, and that it would take many years to provide basic management information to farmers in all parts of the South West. The aim of Rapid Catchment Appraisal is to provide farmers with key technical and management information, including predictions of future salinity impacts and information about available management responses. This is to allow farmers to make well-informed decisions about management options.

Public feedback to the Taskforce about the Rapid Catchment Appraisal process was mixed. The technical information provided was well received by some farmers. However, some considered that the information progressed them no further towards having effective management systems, in part reflecting the State's past neglect of technology development and industry development to which the Taskforce has referred.

Another concern was the whether there would be suitable follow-up technical support for planning and decision making once the information has been absorbed by farmers. The nature of the Rapid Catchment Appraisal Program as a fast-moving process designed to rapidly cover all areas of the agricultural region necessarily means that good extension processes will be compromised to some extent. This reinforces the importance of the recommendations below for improving the tenure and technical expertise of Catchment Landcare Coordinators, to meet this need for technical support and follow up.

However the Taskforce considers that the Department of Agriculture should ensure that the effectiveness of Rapid Catchment Appraisal is not compromised by lack of technical support for interpretation and decision-making following the provision of written reports. It may be preferable for the program to move more slowly through the regions if this can significantly increase the usefulness

of the information and the effectiveness of the program.

Recommendation 5.4.4

The Salinity Taskforce recommends that the Department of Agriculture carefully considers the extension methods used in, and following, the Rapid Catchment Appraisal Program to ensure that full use is made of the information and therefore that the program is effective.

A further gap identified in the Rapid Catchment Appraisal Program was its limited coverage of conservation and biodiversity information.

Recommendation 5.4.5

The Salinity Taskforce recommends that reports provided to landholders under the Rapid Catchment Appraisal Program be broadened to include information on native vegetation and biodiversity. This could include direct biological information as well as contact details for sources able to provide more detailed advice and support.

Another information tool increasingly available to land holders is airborne geophysics data. There are three types of airborne geophysics (magnetics, radiometrics and electomagnetics) with different strengths and weaknesses and different levels of cost-effectiveness. The National Action Plan for Salinity and Water Quality includes a substantial program of airborne geophysics. The Taskforce acknowledges the potential value of this type of information for planning on-ground works. It may help to target works for greatest cost-effectiveness, especially where paleochannels can be identified. On the other hand, the Taskforce notes that suitable paleochannels are likely to be available for only a minority of the threatened land.

In addition, an economic analysis of airborne geophysics in Western Australia found that the value of data provided was modest, when correctly estimated based on the improvement in decision making beyond what is possible with existing information sources (such as digital elevation models and soil-type maps). Finally, it should again be noted that, in many cases, the primary problem is not a shortage of information for planning, but a shortage of economically viable management options for landholders to adopt.

Overall, the Taskforce supports the selected use of airborne geophysics methods, but considers that their expense will probably not be economically justified in all circumstances, so that careful consideration needs to be given to public investments in programs to provide airborne geophysics data.

Recommendation 5.4.6

The Salinity Taskforce recommends that careful consideration be given to the location and scale of public investments in programs to provide airborne geophysical data.

Education, Training and Capacity Building

The Salinity Taskforce identified the need for an improved approach to training of the many 'extension' people involved in salinity and natural resource management. The key objective of the training would be to raise the level of technical expertise of extension agents in areas such as hydrogeology, engineering options, farming systems, woody perennials, native vegetation management, biodiversity and farm-level economic evaluation of management options.

Recommendation 5.4.7

The Salinity Taskforce recommends that additional funds be allocated to the Department of Agriculture to develop a new coordinated training and education program available to all extension officers, advisers and Community Support Officers involved in salinity and natural resource management. The training should improve technical expertise in areas such as hydrogeology, engineering options, farming systems, woody perennials, native vegetation management, biodiversity and farm economics evalutation of management options. The Department of Agriculture should work closely with the proposed Natural Resource Management Office, the Department of Environment, Water and Catchment Protection and the Department of Conservation and relevant non-government organisations to develop this program. Where appropriate the training should be made available to farmer industry groups and individuals.

A different kind of training for rural communities is in building the capacity of individuals and groups to take leadership roles in their communities. Given the degree of land use change needed for salinity management and the importance of innovation from the community to achieve that change, strong leadership is particularly relevant to salinity.

Recommendation 5.4.8

The Salinity Taskforce recommends that the State Government continues to support capacity building initiatives such as the Foundations for Leadership Program for the next five years.

The Taskforce also notes the importance of building awareness and understanding of salinity and natural resource management issues in the broader community, and particularly in schools.

Recommendation 5.4.9

The Salinity Taskforce recommends that the proposed Natural Resource Management Office liaise with the Department of Education to ensure that there is adequate coverage of salinity and natural resource management in school curricula.

Tenure of Community Support Officers

The Taskforce received many expressions of support for Community Landcare Coordinators and other Community Support Officers. However, there was concern at their common lack of experience and of technical knowledge. Related to this, people spoke of their frustration at being unable to provide job security for Coordinators with the result that many communities frequently have to re-employ and re-train new Coordinators.

Recommendation 5.4.10

The Salinity Taskforce recommends that the tenure of Community Support Officers (including Community Landcare Coordinators, Bushcare, Rivercare and Land For Wildlife Officers) be extended to five years to enhance the security of these positions and reduce the problems of high staff turnover and inexperience, and that the State Government negotiate such an arrangement with the Commonwealth Government.

5.4.2 Working with Indigenous People

The Taskforce received comments on Aboriginal involvement with salinity and natural resources management and met with an Aboriginal representative to discuss links with Aboriginal people in more detail. From these limited interactions it is clear that Aboriginal people are both angry and deeply sad about the current situation with rising water tables and spreading salinity.

It was explained to the Taskforce that Aboriginal people have a strong 'sense of place' with the areas where their families lived and that the degradation that has happened impacts directly on all who belong to those areas. They are deeply sad because they have been dispossessed from the land, which is sacred and is their kin, and now they see it 'dying'. They believe they learnt to live in harmony with the land before white settlement and understood what the 'land could take' over many years.

It was suggested to the Taskforce that Aboriginal people are angry because they have been left out of the development of policies and strategies to deal with salinity and natural resources management, and are now finding it very difficult to gain approval and funding for land care projects.

It was pointed out to the Taskforce that while Aboriginal people now control 15 per cent of the land area of Western Australia they have only obtained $200,000 from the Natural Heritage Trust for on-ground projects.

While land title is very important to Aboriginal people, so is land management. Aboriginal people want to work with the Government and the rest of the community to repair the land and vegetation. This is not an idealistic stance, as shown by the strong statement to the Taskforce that Aboriginal people believe there should be more research and development to develop new agricultural industries that will 'fit what the land can handle'. Aboriginal people would also like to see the native bush rehabilitated and remnants connected wherever possible with wide corridors. This is not just to improve biodiversity but it is also to allow Aboriginal people to once again travel and enjoy the bush areas of the agricultural area.

On the positive side, Aboriginal Land Councils and Corporations are now taking a stronger interest in natural resources management and are building landcare into their programs. Good examples of partnerships with government and non-government organisations exist in the north west of Western Australia and in the Northern Territory, but much more needs to be done in the south west of Western Australia.

For Aboriginal people to become better involved in the management of salinity and natural resources, there needs to be progress in several areas:

- Aboriginal people should be included in the development of regional natural resource management strategies and operational plans by building relationships with natural resource management regional groups. Aboriginal facilitators are being appointed in each region and supportive networks are being built with Aboriginal people.
- Key positions should be established in the natural resource management government departments so that networks are built with Aboriginal people and so they are involved in the development of relevant policies, strategies and programs.
- Training should be included for a range of extension officers, especially the Community Landcare Coordinators, on Aboriginal interests, how to work with Aboriginal communities and how to develop and implement joint projects.
- Aboriginal interests should be included in any umbrella natural resource management legislation, including recognition of special sites and involvement in broader land management.
- Aboriginal 'land management' positions should be established for each of the larger regions in the State (South West, Goldfields, Gascoyne-Murchison, Pilbara, Kimberley and East Kimberley).
- An 'Aboriginal Lands Management Advisory Committee' should be established to bring Aboriginal people together with other people with expertise in land management and natural resources management to provide advice and support to Aboriginal land managers.

The Taskforce was reluctant to make detailed recommendations on all of these suggestions because there needs to be further consultation with Aboriginal people and agreement on the best way forward. Even so the Taskforce believes there needs to be much

more attention given to involving Aboriginal people fully in measures to manage salinity and other pressing land management issues. Nevertheless some recommendations can be made.

Recommendation 5.4.11

The Salinity Taskforce recommends that the natural resource management government departments and the natural resource management regional groups review their involvement with Aboriginal groups and establish positions to develop better networks to involve Aboriginal people in the development of salinity and natural resource management policies, strategies, programs and projects.

Recommendation 5.4.12

The Salinity Taskforce recommends that the proposed Natural Resource Management Council for Land and Water and the proposed Natural Resource Management Office work with the Department of Indigenous Affairs, the Department of Conservation, ATSIC and the Aboriginal Lands Trust to establish a suitable 'advisory committee for management of Aboriginal lands in Western Australia', and key 'Aboriginal Facilitator' positions to better involve Aboriginal people in land and water management in Western Australia.

Recommendation 5.4.13

The Salinity Taskforce recommends that the State Assessment Panel work with the proposed Natural Resource Management Office and the natural resource management government departments, and appropriate Aboriginal organisations, to develop simple and equitable procedures for funding from State and Commonwealth Natural Resource Management programs for Aboriginal land and water management projects.

Recommendation 5.4.14

The Salinity Taskforce recommends that one of the positions in the proposed Natural Resource Management Office be designated to ensure Aboriginal groups and organisations are fully involved in the development and implementation of natural resource management policies, strategies and programs.

5.4.3 Coordination of extension

A message from farmers in the public meetings and in their submissions was the need for better coordination and integration of the advice and support they access. The Taskforce was given examples where advisers from different programs (such as Landcare, Bushcare and Rivercare) have different agendas and rules about how they worked with farmers, resulting overall in an inefficient extension system. In addition, farmers utilise a range other advisers, consultants, and scientists.

The Taskforce considers that the Department of Agriculture should lead a coordination process to better integrate the delivery of salinity and natural resource management extension services to farmers and rural local government authorities. This does not mean the Department of Agriculture would directly manage all of these advisers. Rather, the Department, as the primary contact for farmers into Government, should establish a process to coordinate the relationship between the many programs, agencies and other groups to maximise the integration and efficiency of delivery.

Recommendation 5.4.15

The Salinity Taskforce recommends that the Department of Agriculture establish a process to ensure integration and coordination of the delivery of salinity and natural resource management extension services to landowners and land managers in the agricultural area of Western Australia.

5.4.4 Demonstration catchments and participatory research

The Salinity Taskforce considers the formation of close links between scientists and the farming community to be very important. An emphasis is needed on use of local knowledge and experiences when developing research and development projects. There is also scope for improved collation and dissemination of findings from the considerable number of on-farm research trials conducted by agency researchers, farmer groups and individual farmers.

In Section 5.3, in relation to Term of Reference 1.4, recommendations were made about the involvement of farmer groups in different types in participatory research.

The Government has committed $6 million over four years for 'demonstration catchments' and this funding could potentially be matched through the National Action Plan for Salinity and Water Quality. Demonstrations are a means by which new practices or systems may become known to farmers.

The Taskforce is strongly of the view that the demonstration catchment initiative needs to build on the experience of past demonstration initiatives, such as the Landcare Vision program, and the results of research on what drives farmers to adopt new practices. The strong evidence is that extension activities such as demonstrations will not contribute markedly to major changes unless the technologies and systems being demonstrated are effective and attractive to adopt. The Taskforce has noted that there is a general shortage of salinity technologies and systems that would meet these criteria, and that a key priority is the development of improved technologies and new industries.

As a consequence, the Taskforce considers that the demonstration initiative should primarily focus on moving technology development forward, rather than on demonstrating past technologies. There should be close links established to research and development

organisations to ensure that primarily new options are demonstrated. Further, the initiative provides a valuable opportunity to accelerate the process of technology development by involving farmers in participatory research examining and improving as-yet unproved options.

Recommendation 5.4.16

The Salinity Taskforce recommends that the demonstration catchment initiative primarily be concerned with demonstrating and further developing innovative salinity management practices, rather than emphasising relatively well-established options.

In this context, an exclusive emphasis on catchment scale demonstrations may be unnecessary, or even counter-productive. For many of the technologies and systems to be demonstrated or tested, the primary motivation for adoption will be commercial gain in the short to medium term, even though salinity benefits will occur as a side benefit. For the purposes of demonstrating commercially viable systems, the paddock scale is likely to be sufficient. Therefore, the initiative may reach a larger number of farmers in more regions if it relies more on demonstrations at the paddock-scale than at the catchment-scale.

Recommendation 5.4.17

The Salinity Taskforce recommends that demonstrations in the initiative not be limited to the catchment scale. Where appropriate, paddock scale demonstrations may be used to reach more farmers in more regions.

Notwithstanding these comments, the Taskforce supports a broad and integrated approach to the demonstration initiative, involving the full range of management options, including plant-based systems, management of surface water and groundwater, and measures for nature conservation and biodiversity protection.

Recommendation 5.4.18

The Salinity Taskforce recommends that treatments in the demonstration catchments encompass the whole range of management and farming practices appropriate to the catchment type, including water management, new crops and pastures and nature conservation and biodiversity management.

Recommendation 5.4.19

The Salinity Taskforce recommends that the Demonstration Catchments initiative be closely linked to the Engineering Investigation Initiative to emphasise the interrelated nature of a range of management options in many situations.

In selecting the demonstration sites, the following points need to be considered.

- *The demonstrations are accessible to the community.*
- *The landscape is representative of the region.*
- *Baseline data has been collected and the salinity and groundwater processes are being measured.*
- *The catchment community is willing to invest time and money into the initiative.*
- *The catchment community is willing to share their experiences with others.*
- *Ideally, industry partnerships (such as that developed with Alcoa World Alumina) are available (e.g. MetaSource in a bioenergy partnership agreement).*
- *Social and economic impacts can be measured along with biophysical outcomes.*

5.4.5 Economic policy instruments

There is increasing interest in the potential for economic policy instruments to contribute to the better management of dryland salinity in Australia. There are many possible instruments available, including tradeable salinity permits, auctions of rights or permits, enhanced tax deductibility, tax rebates, subsidies on particular inputs/practices, financial rewards for outcomes, cross compliance, cost sharing, and share farming.

The National Action Plan for Salinity and Water Quality includes an examination of the design and potential role of economic policy instruments for salinity. A similar objective was included in the Salinity Strategy 2000 and preliminary assessments of economic instruments were made. In particular, the then Water and Rivers Commission engaged economic consultants to advise on the design and scope for economic policy instruments in the Water Resource Recovery Catchments.

Analyses at the University of Western Australia have concluded that the appropriate role for economic policy instruments for salinity in Western Australia is probably limited to the protection of outstanding public assets, such as in recovery catchments, rather than being applicable to agricultural land in general. There are a number of practical difficulties with the application of economic instruments, including:

- the information needs for a system of economic instruments to operate;
- the difficulty of defining a suitable variable to be the basis for the scheme (e.g. water table depth, the area of saline land, the quantity of salt being exported);
- the "transaction costs" involved in implementing a scheme;
- the initial allocation of rights (e.g. the right to export saline waters versus the right of the community to fresh waters);
- distributional impacts; and
- the need to identify circumstances where there is

so-called "market failure", a necessary condition for economic instruments to be justified.

For economic instruments (or any other form of Government action) to address salinity to be desirable from the point of view of economic efficiency, the following conditions would be required:

- Groundwater systems need to be responsive to changes in land management.
- Land use change must not involve excessive losses of income from currently productive activities.
- Assets of high value are at risk. In general, to justify Government programs to influence on-farm action, a public asset of outstanding value would need to be both at risk and cost-effectively protected by on-farm treatments.

It appears that water resource recovery catchments are likely to be the prime example where economic policy instruments may be appropriate. There remains the question of which type of policy instrument will be best, and this is not a straightforward question. Further investigation is required to determine the best approach. The key point for this report is that, even in a water resource recovery catchment, the problems for successful and effective implementation of any type of economic instrument remain substantial and unresolved.

Further research on economic policy instruments will be conducted in a number of current initiatives, including a program of the National Action Plan for Salinity and Water Quality and a project of the Cooperative Research Centre for Plant Based Management of Dryland Salinity.

Recommendation 5.4.20

The Salinity Taskforce recommends that the State Government, through Treasury, maintains a watching brief on the outcomes of new research into economic policy instruments, to assess the potential contribution of these instruments for promoting salinity management.

5.4.6 Regulation

The Salinity Taskforce does not support the position of some who believe that regulation should be the primary method for achieving major changes in land use for prevention of salinity, but legislation does play an important role for some salinity-related issues.

There is much in common and statute law that is relevant to salinity, including the following:

- Common law;
- Riparian rights;
- Rights in Water and Irrigation Act 1914;
- Soil and Land Conservation Act 1945;
- The Country Areas Water Supply Act 1947;
- Waterways Conservation Act 1976;
- Water Agencies (Powers) Act 1984;
- Land Drainage Act 1925;
- Town Planning and Development Act 1928;
- Environmental Protection Act 1986;
- Conservation and Land Management Act 1984;
- Wildlife Conservation Act 1950; and
- Aboriginal/Heritage Acts.

The Taskforce considers that there is scope to make more effective use of regulation. A recommendation to examine how this can best be achieved is made in the next section (Recommendation 5.5.5) in the context of the new institutional structures, which are recommended to take responsibility for the recommendation.

In addition, Section 5.6.1 on 'Biodiversity and environmental assets' contains a specific recommendation that the Government should strengthen regulations against vegetation destruction where adverse environmental outcomes will occur and that existing and new regulations are strongly enforced (see Recommendation 5.6.9).

5.4.7 Commonwealth Government Programs

This section of the report concludes with comments on three key programs of the Commonwealth Government: the National Landcare Program, the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality. Each of these programs has emphasised activities relevant to this section on encouraging change.

The National Landcare Program

Concerted policy efforts to address salinity in Australia began with the National Landcare Program, launched in 1989 from the foundation of the National Soil Conservation Program. The National Landcare Program started with the premise that awareness raising, education, and catchment planning processes for groups of farmers could solve land degradation in agriculture. A stewardship ethic was to be cultivated among farmers. For more than a decade, this paradigm has been the dominant force shaping resource management policies for agriculture at the national level.

The National Landcare Program approach has been successful in raising awareness of resource conservation issues among farmers, and in some cases this awareness has led to changes in farming practices. It has also clearly had benefits in areas other than salinity. However, as noted elsewhere in this report, the changes achieved for dryland salinity have been too small to prevent ongoing resource degradation.

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.

The primary instruments used within the Landcare program have been provision of paid facilitators and organisers for Landcare groups (often without strong agricultural or technical backgrounds), the development of catchment plans, and subsidies for partial funding of relatively small-scale on-ground works. There has been little hydrological or economic analysis done of these catchment plans or on-ground works. The National Landcare Program was subsumed within the Natural Heritage Trust in 1997. The basic approach and philosophy of Landcare has continued and has also been applied to other programs within the Natural Heritage Trust such as Bushcare.

Although reported levels of membership of Landcare groups are high, farmers are increasingly jaded with the Landcare approach. There is a noticeable trend for Landcare groups to move away from the Landcare banner and adopt a more production-oriented, farming-systems approach, more in tune with the needs and aspirations of their members.

The Natural Heritage Trust, including Bushcare

The Taskforce also found a high degree of dissatisfaction with the Bushcare program for farmers in Western Australia. Bushcare is currently the only program offering funds to support partially on-ground native vegetation and biodiversity works in Western Australia. However, the objectives of Bushcare, which focus on biodiversity, are understandably different to the core objectives of most farmers, and the rigidity of the rules for projects and the non-availability of funds for other purposes has been a source of frustration for them.

The Taskforce was made aware of some important benefits which have resulted from the Bushcare program, including:

- funding for on-ground works, information packages and case studies within the Meta project; and
- funding for the Search project and for conditional subsidies for oil mallee seedlings.

Nevertheless, there clearly are problems with the Bushcare Program, which go beyond the above-noted divergence of objectives. A recurring and very frequent theme in our public consultation has been concern about the complexity and length of the funding application process for Natural Heritage Trust projects. Many farmers feel that the amount of work involved in winning a Natural Heritage Trust grant is much too great. It does appear that the transaction costs created by this process are needlessly large and could be greatly reduced with benefits all round.

An important criterion for Natural Heritage Trust funding is the generation of public benefits. The Salinity Taskforce supports this criterion. However the interpretation that this criterion implies that works must not also generate private benefits for farmers (or others) is illogical and counterproductive in achieving the core objective of public benefits.

In many cases, the most cost-effective approach is the encouragement of environmentally beneficial practices, which generate some benefits to farmers, but not sufficient to make them commercially attractive in their own right.

For this reason, the Natural Heritage Trust criterion to exclude private benefits results in a loss of public benefits, not a protection of them.

Compounding this, the criterion sends a message to farmers that the Natural Heritage Trust is not a partnership. Given that almost all of the existing management strategies needed to address environmental degradation require farmers to sacrifice effort and money (above and beyond the finances provided by Natural Heritage Trust) this interpretation of the public benefit criterion is extremely unwise.

Recommendation 5.4.21

The Salinity Taskforce recommends that the State Government negotiate with Commonwealth Ministers and agencies to address problems with the criteria and application process for the Natural Heritage Trust.

The problems with the Natural Heritage Trust relate to the funding of on-ground works by community groups, rather than to the large-scale initiatives identified above. The Taskforce notes that on-ground works on the scale funded by Natural Heritage Trust, while beneficial in a number of respects, will do little to prevent salinity. They are highly relevant to other aspects of natural resource management, but much less so to salinity management in most cases.

There was also some concern raised by community members about the flexibility of the Bushcare Program in managing biodiversity and bush regeneration.

Recommendation 5.4.22

The Salinity Taskforce recommends that the Bushcare Program continues to work with farmer groups to increase awareness of biodiversity management requirements. However, the program should adopt a more flexible approach, such as acknowledging the potential need for non-local species in areas that have become saline.

The National Action Plan for Salinity and Water Quality

The Commonwealth Government's National Action Plan for Salinity and Water Quality includes a range of measures, including investigation of economic policy instruments (discussed above) and funding to support implementation of Integrated Catchment Plans.

The main vehicle for delivery of funds is proposed to be natural resource management regional groups, and the intended approach appears broadly similar to the Natural Heritage Trust, with an emphasis on

planning and on provision of partial subsidies for on-ground works on private lands. The National Action Plan emphasises "Integrated Catchment/Region Management Plans" to be developed "by the community". The community is to be supported in this by the existing facilitator and coordinator network, by skills development programs, by extension of technical information, and by a major public communication program "to promote behaviour change and community support".

The Taskforce is concerned that this approach is ill conceived and will be ineffective against salinity, for reasons explained in Section 2 of this report.

The natural resource management regional groups who are to allocate and manage the funds will need very high levels of information, expertise and leadership if they are not to allocate the money in ways that will be socially and politically attractive, but technically and economically inefficient.

Provision of high levels of technical information from Government and research organisations will be essential for the process to operate effectively. A recommendation on this matter was included in Section 5.2. The natural resource management regional groups who are to allocate and manage funds will also need high levels of administrative and financial support in order to maintain transparent decision-making processes and well maintained financial records required for block funding arrangements. It is the view of the Chairs of the natural resource management regional groups, and one that is shared by the Taskforce, that a centralised management and accountability model for the State should be developed.

Findings and recommendations relating to the setting of targets under the National Action Plan for Salinity and Water Quality were presented in Section 5.2.2.

A further concern is that there may be pressures to begin rapid expenditure of National Action Plan funds, before careful analyses of potential investments have been conducted.

Recommendation 5.4.23

The Salinity Taskforce recommends that on-ground works that may be funded by the National Action Plan for Salinity and Water Quality be subject to sufficient technical and economic analysis before approval to ensure that funds are spent in ways that are technically effective and cost-effective. An approach that rushes into implementation of on-ground works without adequate assessment should be strongly resisted.

In Section 5.2, it was recommended that funds should be provided from the National Action Plan to resource the analyses that will be required.

Finally, the Taskforce is concerned about the narrow concept of how National Action Plan funding should be delivered, primarily through regional groups. The State Salinity Strategy includes a mix of delivery mechanisms to best suit the issue at hand and the scale at which it needs to be addressed. These delivery mechanisms variously involve individual farmers, local groups, regional groups, industry associations, research and development institutions, and State agencies, plus State and regional policies and strategies.

An appropriate mix of these mechanisms is essential and would not be achieved by the existing planned approach of the National Action Plan for Salinity and Water Quality. As a key example, statewide programs of industry development are a priority need for successful large-scale salinity management in Western Australia. The Taskforce is recommending that a significant proportion of salinity funds should be directed to this end, rather than to on-ground works selected by natural resource management regional groups.

Recommendation 5.4.24

The Salinity Taskforce recommends that in negotiating with the Commonwealth Government over the National Action Plan for Salinity and Water Quality, the State Government should emphasise that a range of other delivery mechanisms are needed to best suit the issue at hand and the scale at which it needs to be addressed. Delivery of funds through natural resource management regional groups should not be the predominant vehicle for delivery of funds from the National Action Plan for Salinity and Water Quality.

Recommendation 5.4.25

The Salinity Taskforce recommends that in view of the major budget commitments entailed and the significant problems identified in the National Action Plan for Salinity and Water Quality, the State Government maintain a strong stance in negotiating the National Action Plan to seek outcomes which will most effectively enhance salinity management in Western Australia.

What people said about institutional arrangements and partnerships

"Council supports and believes in the concept of natural resource management (NRM) and this is stated in the State Salinity Strategy. Council has always believed that Salinity Council would evolve into a NRM Council...There is a growing case for Council to become a statutory body as community processes matures."

State Salinity Council

"The Salinity Council needs to be retained as a committee of a statutory NRM Council. This will achieve integration across Government and community yet maintain a focus on salinity which would be lost if it were to become too broad."

Water and Rivers Commission

It would appear that NRM is going to be delivered through the ministries of Environment and Agriculture. There should be housed on the same floor in the same building. Local Government and Regional Development should be close by, in the same building, if not on the same floor. The cumbersome State Salinity Council should become a Reference Group advising a newly appointed Natural Resources Management Council or Commission (statutory body, no more than 15 people, revamped SLCC). The existing NRM groups should become statutory bodies . . .

Mount Marshall LCDC

"Regional Natural Resource Management organisations have been evolving over the past several years and involve all stakeholders from Government agencies to rural communities in the communication process. Any major change from this structure would risk losing community support.

Western Australian Farmers Federation

"There are too many conservation, natural resource management issues that are dealt with by individual government agencies, largely in isolation from other government agencies. The Wildflower Society supports the need for a whole of government approach and the introduction of processes and mechanisms that will ensure a more integrated and co-ordinated approach from government."

Wildflower Society of Western Australia

"The enormous number of statutory bodies dealing with single NRM issues needs to be rationalised. Government does not give effective support to strategic community groups. The formation of many additional groups is partly due to the response to inadequacies of the community structural interface with government."

Jean Webb

"I urgently request the Government to restructure the landcare industry with particular reference to the membership structure of the State Salinity Council. A single authority should be established so as to clearly identify to the community who is responsible for policy formulation and decision making. This Authority's membership should comprise of individuals not driven by ego or politics, but selected for their experience, achievements and their broad philosophical views.

Soil Conservation Services

"Regional groups exist because regional and local communities have recognised that there is a natural resource management problem, including salinity, that government and communities do not deal with, that requires urgent attention."

NRM Regional Chairs

5.5 Institutional arrangements and partnerships

In advising on appropriate institutional arrangements and partnerships for natural resource management and salinity, the Taskforce is responding to four Terms of Reference:

- Review the statewide structures that support a whole of Government and community approach to implementation of the Salinity Strategy and Action Plan (TOR 3);
- Integration of actions across Government at Ministerial, agency and regional level(TOR 1.3);
- Review the processes through which statewide structures report and are accountable to government and the community (TOR 4); and
- The relationship to and congruence with regional Natural Resource Management Strategies (TOR 1.6).

In Australia, State, Territory, Local and Commonwealth governments are introducing a range of institutional and structural measures to promote more sustainable use and management of the nation's natural resources. These new approaches are aimed at better integration across Government sectors to improve service delivery and stronger involvement of communities and land owners in policy development, setting priorities and decision-making.

5.5.1 Statewide structures that support a whole of Government and community approach to the implementation of the Salinity Strategy and Action Plan

The Western Australian Government has established four Cabinet Standing Committees covering Environmental Policy, Regional Policy, Economic Policy and Social Policy. Policy units within the Department of the Premier and Cabinet support the four Standing Committees. A separate Sustainable Development Policy Unit has been formed to facilitate integrated policy development and delivery across Government. This new integrating and coordinating framework provides a strong foundation for the management of natural resources and salinity in Western Australia.

Western Australia also currently has a State Salinity Council and a number of natural resource management regions. The State Salinity Council was established to promote a coordinated approach to tackling salinity, primarily in the south west of Western Australia. A State Assessment Panel with overlapping membership to the Salinity Council oversees delivery of the Natural Heritage Trust Program in Western Australia.

The natural resource management regions have emerged partly in response to Commonwealth funding programs, but also in an attempt to attain a more integrated and effective approach to natural resource management issues in different parts of the State. Each natural resource management region has its own community-based leadership group and State Government departments and Commonwealth funding, most recently from the Natural Heritage Trust, variously support these groups. Sub-regional groups have formed in most regions and these interact directly with local groups, such as Land Conservation District Committees and small catchment groups.

The Land Conservation District Committees (LCDCs) have been the mainstay of on-ground action for land care and salinity in the past. However, the Taskforce is aware that the future for LCDCs is at a crossroads. While some remain active, others are effectively moribund. Some LCDCs have evolved into other broader agricultural sustainability groups, such as the Esperance Regional Forum or the Liebe Group. The Taskforce considers that any future consideration of natural resource management in Western Australia should give serious consideration to the role of LCDCs and whether they need to continue to be established by statute with statutory powers. A more flexible arrangement may be desirable, in recognition of the multiple community-based landcare and environmental groups of different types that are now active in Western Australia.

Another type of community group that has evolved in the past few years are farm industry groups such as the WA Lucerne Grower's, the WA No-Till Farmers Association, the Saltland Pastures Association and the Oil Mallee Association.

A recommendation about the inclusion of such groups in participatory research, development and extension was made in Section 5.3.

The key Government Departments for rural natural resource management in Western Australia are the Departments of Agriculture; Conservation; Environment, Water and Catchment Protection; and to a lesser extent, Fisheries.

There are four other parts of State Government that are important for Natural Resource Management and salinity management. These are Local Government and Regional Development, State Development, Planning and Infrastructure and the Environmental Protection Authority. They are important because the first three lead planning and development of the State, while the Environmental Protection Authority assesses the environmental impact of development proposals. The Environmental Protection Authority may also become the body that audits natural resource management and salinity targets in Western Australia.

All of these aspects of Government need to be working well together to ensure an effective response to salinity. Recommendations to support integration across Government at Ministerial, agency and regional level are set out below.

5.5.2 Integration of actions across Government

For integration of actions to occur across Government there needs to be an overall framework or model which should include:

- Integration across the whole of Government through the Sustainable Development process that the Government has established, including the four Cabinet Standing Committees and their Policy Units and the Sustainability Unit.
- The establishment of a natural resource management structure to link into the Government's Sustainable Development framework through the Cabinet Standing Committee on Environmental Policy. This includes an enabling Natural Resource Management Act, a Government Natural Resource Management Policy and Plan, an advisory Natural Resource Management Council for Land and Water and a Natural Resource Management Office. This structure builds on existing government and community structures at State, regional and local levels.
- The creation of an advisory Natural Resource Management Council for Land and Water that would report directly to the Minister for the Environment and Heritage, the Minister for Agriculture and the Cabinet Standing Committee on Environmental Policy. The new Council will provide an umbrella role to ensure a comprehensive and coordinated approach to natural resource management by the other peak natural resource management bodies such as the Conservation Commission and Soil and Land Conservation Council, even though some of these bodies have separate statutory roles.
- The discontinuation of the State Salinity Council. The current Salinity Council Executive would become a committee of the proposed Natural Resource Management Council for Land and Water as an interim arrangement.
- The current Chairs of the natural resource management regional groups becoming a committee of the proposed Council.
- The Government Natural Resource Management Policy and Plan becoming an umbrella for existing natural resource management policies and strategies even though some of these arise from separate statutory responsibilities. Gaps will be identified and policies and strategies developed to fill them.
- The establishment of a Natural Resource Management Office. This office should comprise of a small team of senior staff with direct access to the policy levels of Government who are able to negotiate directly with Government departments and the community groups, to ensure implementation of the Government's Salinity Strategy and Natural Resource Management Program.
- The amalgamation of the current Natural Heritage Trust and State Salinity Council Secretariat into the Natural Resource Management Office.
- The implementation of a range of processes to promote integration including Regional Strategies and Partnership Agreements.

Natural Resource Management Council for Land and Water

With the experience gained through the Salinity Council and the recommendations of the Machinery of Government Taskforce, the Salinity Taskforce considers that it is now appropriate to establish a Natural Resource Management Council for Land and Water as the peak body to coordinate and oversee natural resources management in Western Australia.

The proposed Natural Resource Management Council for Land and Water would advise the Government on all natural resource management issues related to use and conservation of land and inland waterways. It would have the power (with the approval of the Cabinet Standing Committee on Environmental Policy) to establish committees to provide a focus to address priority natural resource management issues in addition to salinity. The proposed Council would also need to establish close working relationships with the other peak Natural Resource Management bodies such as the Conservation Commission and the Soil and Land Conservation Council to eliminate duplication and ensure an integrated approach to Natural Resource Management, where there are existing statutes and legislative responsibilities.

The Taskforce notes that the Machinery of Government Taskforce has recommended that the future role of the Soil and Land Conservation Council be reviewed.

The proposed Natural Resource Management Council for Land and Water should have high standing with Government and in the community, similar to the Environmental Protection Authority. It would report to both the Minister for the Environment and Heritage and the Minister for Agriculture and more broadly to the Cabinet Standing Committee on Environmental Policy.

The Salinity Council Executive should become a Committee of the proposed Natural Resource Management Council for Land and Water as an interim arrangement to ensure the management of salinity continues to have a strong focus, until its membership and terms of reference are reviewed by the proposed Council.

A key issue that needs to be considered is whether the proposed Natural Resource Management Council for Land and Water should be a statutory body with powers. The Taskforce is firmly of the view that the proposed Council should be established by statute, through a Natural Resource Management Act, to give it status and standing to carry out its charter, but that it should not have independent powers at this stage.

In other words, it would work in an advisory capacity with the 'client' Ministers and in partnership with the policy units in the Department of Premier and Cabinet, and natural resource management departments and the natural resource management regional groups.

This approach supports the Machinery of Government Taskforce recommendation that 'an advisory Natural Resources Council should be created to provide holistic policy advice and a high profile direct interface between Government and the community.'

Recommendation 5.5.1

The Salinity Taskforce recommends that the Government establish by 30 June 2002 an interim Natural Resource Management Council for Land and Water (pending promulgation of a Natural Resource Management Act). An independent member of the community with significant experience in integrated natural resources management would Chair the Council. The Council's membership would include the Directors General of the Departments of Agriculture, Conservation and Land Management, and Environment, Water and Catchment Protection and nine other members with expertise in the following areas:

- *Industry development;*
- *Regional and local delivery of Natural Resource Management;*
- *Nature conservation, biodiversity and native vegetation management;*
- *Regional development and local government;*
- *Climate change and Greenhouse;*
- *Social issues and impact;*
- *Natural resource economics;*
- *Research and development; and*
- *Environmental regulation and impact assessment.*

Recommendation 5.5.2

The Salinity Taskforce recommends that the proposed Natural Resource Management Council for Land and Water advise and report to the Minister for the Environment and Heritage and the Minister for Agriculture.

The final membership and functions of the proposed Natural Resource Management Council for Land and Water needs to be developed with full stakeholder consultation, but the Taskforce believes the Council's roles and responsibilities should include:

- Consulting widely under the direction of the 'client' Ministers and the Cabinet Standing Committee on Environmental Policy to prepare a State Natural Resource Management Policy and Plan.
- Providing advice to the 'client' Ministers and the Cabinet Standing Committee on Environmental Policy on priorities for natural resource management in Western Australia.
- Ensuring that priority natural resource management issues are being addressed in an integrated, effective and efficient manner.
- Ensuring that outcomes, objectives and targets are established for natural resource management priority issues and that appropriate monitoring and auditing procedures to evaluate progress are in place.
- Implementing processes and procedures to involve the community in natural resource management at State, regional and local levels.
- Working with other peak natural resource management, industry and conservation groups to formulate and promote relevant natural resource management policies, strategies and implementation plans.
- Promoting and facilitating procedures to ensure the integrated development and implementation of natural resource management programs.
- Supporting the establishment and effective operation of natural resource management regions and groups, including the development of partnership agreements, the implementation of State natural resource management policies and strategies, and processes for decision making about equity issues and tradeoffs.
- Preparing, publishing or endorsing statements concerning the State's natural resources.
- Ensuring strong links with state and regional planning, State and regional development, environmental protection and local government.

The State Salinity Council has provided a valuable role in coordinating implementation of the Salinity Strategy. It has been ably assisted by a small secretariat which provides administrative support and also coordinates delivery of Natural Heritage Trust funding and assessment of projects. In effect the Salinity Council has been a defacto Natural Resource Management Council, but this has caused confusion with other statutory and non-statutory bodies such as the Soil and Land Conservation Council, the former National Parks and Nature Conservation Authority and the Natural Resource Management Regional Chairs Group. The Taskforce also acknowledges the expertise and experience of Council members and is of the view that these qualities should be utilised in the development of these new structural arrangements.

Recommendation 5.5.3

The Salinity Taskforce recommends that the existing Salinity Council be discontinued and as an interim arrangement, the current Executive of the Salinity Council become a committee of the proposed Natural Resource Management Council for Land and Water.

Natural Resource Management Office

The proposed Natural Resource Management Council for Land and Water needs to be well supported and have the status to carry out its charter to operate effectively across Government and with the community and industry. As well as a series of integrating processes which are set out below, the proposed Natural Resource Management Council for Land and Water requires a small core of senior and experienced staff led by an experienced CEO level officer to carry out the following functions:

- Provide executive support to the proposed Natural Resource Management Council for Land and Water.
- Provide links to the Cabinet Committees and Policy Units in the Department of the Premier and Cabinet for development of policy and delivery of natural resource management programs as part of the Government's Sustainable Development Strategy.
- Negotiate with the natural resource management departments to deliver integrated programs, budgets and actions to deal effectively with natural resource management issues such as salinity.
- Coordinate natural resource management funding programs on behalf of the State, including regional delivery of funds in accordance with State and Commonwealth agreements and specifically the National Action Plan for Salinity and Water Quality.
- Work with the natural resource management departments and the natural resource management regional groups to develop regional natural resource management strategies and partnership agreements.
- Support the development of natural resource management outcomes, objectives and targets, as well as the development and ongoing maintenance of monitoring and evaluation systems.
- Under direction of the proposed Natural Resource Management Council for Land and Water ensure the establishment of clear natural resource management outcomes, objectives and targets, and the development and ongoing maintenance of monitoring and evaluation systems.
- Ensure and maintain effective links with Regional Development, State and Regional Planning and local government so that natural resource management becomes an integral part of the social and economic development of the State.

While the Taskforce's preference is that the Natural Resource Management Office be established separately from existing natural resource management departments, the Taskforce accepts that there are a number of other options as to where within Government the Office could be located including:

- the Office of the Minister with Special Responsibility for Salinity;
- the Department of the Premier and Cabinet;
- the Department of Environment, Water and Catchment Protection;
- the Department of Agriculture; or
- the Department of Conservation.

Of these, the Taskforce's preference is that the Natural Resource Management Office not be located with a natural resource management department. However, if the Government decides that it should be with such a Department, the Taskforce would recommend the Department of Environment, Water and Catchment Protection because of the consistency with this Department's role, as recommended by the Machinery of Government Taskforce.

Recommendation 5.5.4

The Salinity Taskforce recommends that the Government establish a Natural Resource Management Office to support the proposed Natural Resource Management Council for Land and Water and provide integrated across-Government responses to natural resource management issues such as salinity.

Natural resource management legislation

Comments were made to the Taskforce that there was enough existing legislation to cover the management of salinity and other Natural Resource Management issues if it was coordinated and used effectively. While this may be true, the Taskforce is only aware of a limited number of situations where different pieces of legislation have been used to address natural resource management issues and these have mainly been in cases of more intense resource competition such as water supplies from groundwater mounds for metropolitan Perth.

Nevertheless, there is considerable potential to improve the use of existing legislation separately or together to support the adoption of better land management activities and to discontinue those that are causing degradation.

Recommendation 5.5.5

The Salinity Taskforce recommends that the proposed Natural Resource Management Office work with the Environmental Policy Unit in the Department of the Premier and Cabinet, the natural resource management departments and the natural resource management regional groups to recommend how existing natural resource management legislation can best be used to support the management of salinity and other priority natural resource management

issues. The resulting report and recommendations will be reviewed by the proposed Natural Resource Management Council for Land and Water and forwarded to the Cabinet Standing Committee on Environmental Policy for consideration.

In general, comments and submissions did not favour the formation of statutory natural resource management regional groups at this stage of their evolution in Western Australia. However, there was support for a statutory natural resource management framework in Western Australia that establishes a natural resource management peak body (the proposed Natural Resource Management Council for Land and Water), provides a basis for the natural resource management structures and processes and sets out the objectives and principles for natural resource management in Western Australia. Such legislation would be enabling rather than prescriptive so that flexibility for regional and local variations would be retained. Some potential models exist, particularly the recent draft natural resource management legislation in South Australia.

The Taskforce does not wish to be prescriptive on the content of such legislation as it needs to be developed in consultation with stakeholders but it should include the following 'objects' and 'mechanisms':

Objects

- Promote and facilitate integrated management of the State's natural resources as part of the Government's approach to sustainable development.
- Provide arrangements to promote integration and coordination across State Government natural resource management peak bodies and departments.
- Provide arrangements to involve the community in the development and implementation of natural resource management policies, plans and strategies at State, regional and local levels.

Mechanisms

- Establish a Ministerial committee to integrate natural resource use and management across all Government legislation and programs and report to Cabinet (the existing Cabinet Standing Committee on Environmental Policy fulfils this aspect).
- Establish a Natural Resource Management Council for Land and Water to support the Ministerial Committee, with membership including the natural resource management departments and community members with experience and standing in various aspects of natural resource management.
- Require the Ministerial Committee and the proposed Natural Resource Management Council for Land and Water to prepare a State Natural Resource Management Policy and Plan which sets out the way integrated Natural Resource Management will be developed and delivered in Western Australia, including the use of partnership agreements.
- Establish the basis for natural resource management regions and natural resource management regional groups (without being overly prescriptive).
- Require regional groups to work in partnership with the natural resource management departments to prepare natural resource management and investment strategies for endorsement by the Ministerial Committee and Cabinet.

Recommendation 5.5.6

The Salinity Taskforce recommends that the Environmental Policy Unit in the Department of the Premier and Cabinet work with the proposed Natural Resource Management Council for Land and Water and Natural Resource Management Office, the natural resource management departments and the natural resource management regional groups to prepare drafting instructions for an umbrella Natural Resource Management Act for Western Australia by 30 March 2002.

Natural Resource Management Policy and Strategy

The main heading of the 2000 Salinity Strategy was 'Natural Resource Management in Western Australia'. Several of the regional 'Natural Resource Management' strategies have similar headings. This is an indication that the evolutionary approach in Western Australia is already well advanced in identifying a range of policies and strategies as falling under a natural resource management "umbrella".

While the State natural resource management departments have taken a useful first step in developing a 'framework to assist in achieving sustainable natural resource management' this does not go far enough in formally recognising and supporting the existing natural resource management structures and processes.

An essential step is a State Natural Resource Management Policy and Plan promulgated by the Government to build on and amplify the proposed Natural Resource Management Act and provide more detail on how natural resource management will function across Government, Government departments, the community and industry.

Such a policy and plan would provide an umbrella and context for the existing natural resource management policies and strategies and show how natural resource management will link to other key aspects of government such as planning, regional development, environmental protection and local government.

The policy would set out the Government's vision,

objectives and key strategies to achieve integrated natural resource management. The plan would set out detail on the mechanisms and processes for implementing integrated natural resource management including the content, process for preparing and process for endorsement of regional natural resource management strategies.

Recommendation 5.5.7

The Salinity Taskforce recommends that the Environmental Policy Unit in the Department of the Premier and Cabinet works with the proposed Natural Resource Management Council for Land and Water and Natural Resource Management Office, the natural resource management departments and the natural resource management regional groups to develop a comprehensive natural resource management policy and plan which together set out the vision, objectives, operating arrangements and cross Government links for natural resource management and salinity management in Western Australia.

Natural resource management regional groups

Western Australia already has a community-based natural resource management regional framework, built on the large number of landcare and catchment groups.

There are five natural resource management regional groups in the South West of Western Australia: Avon Working Group (AWG); Northern Agricultural Integrated Management Strategy Group (NAIMS); South Coast Regional Initiative Planning Team (SCRIPT), South West Catchments Council (SWCC) and the Swan Catchment Council (SCC). The natural resource management regional groups are community representative structures with membership largely founded on democratic principles.

Several sub-regional groups exist under these regional groups, such as the Blackwood Basin Group and the Moore River Catchment Council. The natural resource management regional groups are a key component of the delivery of State and Commonwealth natural resource management policy. The regional groups also provide a consolidated voice for the issues and needs of the communities they represent.

Some submissions recommended using regional groupings of local government authorities or the existing Regional Development Commissions as the regional framework for natural resource management. While this may appear attractive and may be the way to evolve in the future, the majority view was that it was too early to make such major changes in Western Australia. The Taskforce endorses this view. Regionalising local government to this extent would be a major step in Western Australia and would need considerable consultation and development. Using the Regional Development Commissions could divert them from their core business and would require significant legislative change.

The Taskforce considers that it would be better to build on the existing regional framework of natural resource management regional groups and establish stronger links to local government and the regional development framework. Once experience has been gained with these arrangements, consideration could be given to merging the natural resource management structures with either the regional development framework or with a regional local government structure.

The Taskforce recognises the importance of the natual resource management regional groups in the application of the National Action Plan for Salinity and Water Quality particularly in the negotiation of agreed targets and outcomes and in the design of processes that aim to engage people to undertake actions within the context of the National Action Plan.

The Salinity Taskforce considers that the natural resource management regional groups should continue to work in close partnership with Government to identify natural resource management issues, roles and responsibilities, priorities for action and steps for implementation in each region. They would provide strong cross-links to regional development and regional planning, and take into account the social aspirations of people in the regions.

It is also important that natural resource management regional groups work together to provide an integrated State approach to natural resources management as well as developing strategies and action plans for their own region.

This 'working together' has started with the chairs and executive officers of the existing natural resource management regional groups meeting together under the auspices of the Soil and Land Conservation Council. It can be continued and strengthened under the arrangements proposed in this report. For example, the Chairs of the natural resource management regional groups could become a committee of the proposed Natural Resource Management Council for Land and Water.

While terms of reference and membership need to be developed it is important to retain flexibility to cater for the different needs and circumstances across Western Australia from the densely populated Swan/Metropolitan region, through the agricultural regions to the vast areas of the rangelands.

The Taskforce also appreciates the significant role natural resource management regional groups have in:

- providing influence and advocacy for regional catchment needs;
- the facilitation and coordination of regional research and development and communication initiatives;
- representing community views and coordination of Government policy;

- avice to the Government, Government departments and other community groups;
- managing the delegated funding to ensure transparency and accountability;
- lobbying to ensure adequate representation of regional natural resource management issues at all forums;
- brokering opportunities, particularly corporate investment within the regions; and
- providing an important 'reality check' of the intents and outcomes of projects developed and intended for the region, its catchments and sub-catchments.

Some might say that a number of these functions are also funcntions of the natural resource management departments. While this may be true it is not surprising, because there will be complementary roles for government departments and natural resource management regional groups in any integrated approach to natural resource management. This is a strength, not a weakness, and any potential duplication will be overcome through the joint preparation of regional strategies and partnership agreements.

The Taskforce has a number of concerns regarding the status of the regional groups. The expectations and workload of the regional groups, particularly the Chairs, are considerable while the administrative support is variable and often short-term (some more than others). The level of awareness of the existence of the regional groups is generally low throughout the community and the capacity to involve the community in regional natural resource management initiatives is limited. Partnership arrangements between State government departments and the natural resource management regional groups are uncertain and unclear.

Significantly, Commonwealth Government and State Government grants programs and initiatives are becoming increasingly dependent on regional groups for their delivery and accountability. It is therefore essential that the partnership arrangements, administrative support and capacity of the natural resource management regional groups are strengthened and formalised.

Recommendation 5.5.8

The Salinity Taskforce recommends that the primary activities of the natural resource management regional groups are:

- *negotiation of natural resource management targets and outcomes in their regions consistent with State outcomes and targets;*
- *monitoring and evaluation of the agreed targets and outcomes;*
- *supporting the communication of technical information to community groups;*
- *providing administrative support for Community Landcare Officers;*
- *providing a regional perspective in the development of State and Commonwealth Government policy;*
- *developing regional natural resource management policy and strategies;*
- *providing advice on strategic natural resource management investment, particularly in identifying areas of high risk;*
- *assisting in the assessment of new initiatives and innovations;*
- *integrating natural resource management regional programs with other statewide initiatives thereby providing opportunities for whole of Government approaches;*
- *developing communication systems that enable the regional community to become more aware of the activities of the regional group and individuals to explore the ranges of activities undertaken within the region;*
- *providing direction and training support for Community Landcare Coordinators and other natural resource management extension officers; and*
- *taking part in the process of the allocation of public funds within the region.*

Membership of the natural resource management regional groups should reflect these tasks.

Recommendation 5.5.9

The Salinity Taskforce recommends that partnership agreements be developed between the natural resource management regional groups and the Departments of Agriculture, Conservation, and Environment, Water and Catchment Protection.

Currently the Departments of Agriculture and Environment, Water and Catchment Protection provide considerable support to the natural resource management regional groups and other sub-regional groups. This partnership, together with support from the Soil and Land Conservation Council, has enabled the regional groups to develop their regional natural resource management strategies.

However, the focus of the Commonwealth Government's National Action Plan is water quality and salinity, which, according to the Machinery of Government Taskforce, are primarily the responsibility of the Department of Environment, Water and Catchment Protection. In addition, the Department of Environment, Water and Catchment Protection has been given the responsibility of providing a framework for catchment management, including a leadership role across Government, by the Machinery of Government Taskforce. Therefore, the Salinity Taskforce considers that the Department of Environment, Water and Catchment Protection should be the lead agency responsible for providing

support to natural resource management regional groups.

The other natural resource management departments would play important supporting roles linked to their core business and legislative functions, with these relationships being clarified in a Memorandum of Understanding or partnership agreement.

As a result, the Department of Agriculture will have increased capacity to work, in partnership, with the emerging farming systems groups (for example the Facey and Liebe groups) and farming industry groups (for example the WA No-Till Farmers Association and the Saltland Pastures Association). It will also allow the Department to improve coordination of the various extension and support services as recommended earlier in the report. This shift in responsibility reflects the primary focus of the Department of Agriculture, which is farm business viability and industry development.

Recommendation 5.5.10

The Salinity Taskforce recommends that the Department of Environment, Water and Catchment Protection be responsible for providing core administrative support and support to prepare partnership agreements and regional strategies for the natural resource management regional groups and that this be done as a matter of urgency.

The Taskforce recognises and appreciates the hazards of separating natural resource management responsibilities from industry development responsibilities. While it is the case that many of the industry groups have evolved from Land Conservation District Committees or catchment groups, the focus of the industry groups remains farm and resource sustainability. The natural resource management regional groups, however, have the capacity to maintain an overarching responsibility to report on the 'state of the region' and provide strategic investment advice to Government and private companies. In addition, the proposed Natural Resource Management Council for Land and Water and the proposed Natural Resource Management Office will provide a stronger impetus for coordination and integration across the farm industry and natural resource management sectors.

Recommendation 5.5.11

The Salinity Taskforce recommends that the natural resource management regional groups establish links with the various farm industry groups that are active in their region. This link will ensure that the natural resource management regional groups are well informed on research and development initiatives and able to support new industry development.

Salinity is an issue that may require the adoption of initiatives and industries that are currently under-developed or as yet unknown. While there is a call for strategic investment processes, there is some risk that new ideas and innovations will have fewer opportunities to be demonstrated and encouraged. In developing alternative ways of managing salinity small business ideas, for example new pumps, desalination systems and alternative uses for salt, may emerge. The natural resource management regional groups and the proposed Natural Resource Management Council for Land and Water should be recipients of requests for investment, trials and demonstrations of these potential innovations.

Regional strategies

The development of regional natural resource management strategies is a key initiative to provide agreement on priorities for each region, which are endorsed and supported by the State Government and the natural resource management departments. Each of the existing natural resource management regional groups in the South West of Western Australia has prepared final or draft regional strategies, but none of these have been signed off or endorsed by Government except for the purpose of Natural Heritage Trust funding. Additionally, none have attempted to apply a process for prioritising investment consistent with the Salinity Council's Framework for Investment in Salinity Management. Similarly, the previous 'Western Australian Government framework to assist in achieving sustainable natural resource management' provides detailed criteria to the community regional groups for the content and endorsement of regional strategies but no process or support from the Government departments to prepare the strategies is set out.

Well-developed and prioritised regional strategies will provide a firm basis for the State to work with the Commonwealth and negotiate for funding through programs such as the next phase of the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality.

For regional strategies to be effective they need to be developed in full partnership between Government departments, industry and the community and endorsed in an open and supportive environment. There must also be rigorous prioritisation of programs and projects in line with the Strategic Investment Framework referred to earlier in this report.

The proposed Natural Resource Management Office should facilitate the process of development and endorsement with nominated senior and regional officers from the natural resource management departments, working in partnership with the natural resource management regional groups and their support staff. Endorsement will show that the regional strategy accords with Government policies and strategies and is suitable to be used in negotiating with the Commonwealth for regional delivery of Commonwealth funds.

Recommendation 5.5.12

The Salinity Taskforce recommends that regional natural resource management strategies be developed in full partnership between the natural resource management regional groups and the natural resource management by Government departments for 'sign off' and endorsement by the proposed Natural Resource Management Council for Land and Water and Government through the Cabinet Standing Committee on Environmental Policy.

Recommendation 5.5.13

The Salinity Taskforce recommends that the content and scope of regional strategies be jointly agreed by the proposed Natural Resource Management Council for Land and Water working with the natural resource management regional groups and the natural resource management Government departments, facilitated by the proposed Natural Resource Management Office. The resulting agreed content and scope to be endorsed by the Cabinet Standing Committee on Environmental Policy and Cabinet.

Partnership agreements

Partnership agreements need to be developed at the regional and sub-regional level between community groups, Government departments and industry groups, to establish clear roles and responsibilities, accountability, working arrangements, support mechanisms and dispute resolution procedures.

Recommendation 5.5.14

The Salinity Taskforce recommends that the Government formally endorse the development of Partnership Agreements through the Natural Resource Management Policy and authorise the proposed Natural Resource Management Council for Land and Water and the proposed Natural Resource Management Office to lead the process of developing such agreements between the natural resource management Government departments and the natural resource management regional groups.

Resourcing and Government support

A major issue for the natural resource management regional groups is a long-term commitment by Government to their support. If a strong and resilient natural resource management framework with Government in partnership with the community is to be established in Western Australia, it is important that the community component has long-term and secure support.

Currently the support to natural resource management regional groups is variable, so that some are very well supported and others have only tenuous and short-term support. Some of this support comes from State Government departments but most comes from short-term funding from the Natural Heritage Trust.

If State and Commonwealth governments provided this core support funding on a more secure basis, separate from program and project funding it would be a big step forward for government-community relationships in natural resource management and a demonstration of the Government's commitment to a full partnership approach.

Recommendation 5.5.15

The Salinity Taskforce recommends that the proposed Natural Resource Management Council for Land and Water and the proposed Natural Resource Management Office develop a core support funding framework recognising the need for very substantial funding for natural resource management regional groups in Western Australia. The framework should include simple budget and audit processes, and be used in negotiations with the Commonwealth Government. In the interim the Environmental Policy Unit within the Department of the Premier and Cabinet should work with the Department of the Environment, Water and Catchment Protection to begin development of the framework (see also recommendation 5.5.10).

5.5.3 Working with Local Government

In recent years following international and national initiatives on sustainable development and natural resource management, local governments across Australia have been considering a greater role in natural resource management. Some have done this, but for many local government authorities, especially those in rural Western Australia, there is a real lack of capacity and resources to take on more responsibilities.

Additionally, the submission from the Western Australian Municipal Association to the Salinity Taskforce makes the point that the current Salinity Strategy has little reference to the role and contribution that local government could make, except for the Rural Towns Program.

For some time there has been a lack of clarity in Western Australia about what the role of local government might be in natural resource management, despite local government being "the most accessible government face to the community". While the Municipal Association believes that there is great variation in the capacity of Western Australia local governments to take on a greater role in natural resource management and that there are some councils undertaking very good work, there is a need to clarify local governments involvement in natural resource management.

Another significant issue is the lack of resources that local government authorities (particularly rural authorities) have to enable them to effectively contribute to natural resource issues in their municipalities. Local government funding principally comes from the rates they raise and through the Grants Commission. Small rural councils have limited opportunities to raise rates for non-core business, so

additional funding through the Grants Commission is seen as the most likely way to support local government becoming more involved with natural resource management.

Recommendation 5.5.16

The Salinity Taskforce recommends that the proposed Natural Resource Management Council for Land and Water and the Natural Resource Management Office work with the Western Australia Local Government Association to clarify the roles that local government could effectively play in natural resource management and how the local government authorities can be better resourced and supported.

Rural local government authorities have provided strong support to farmer groups through direct assistance and by supporting extension staff, particularly Community Landcare Coordinators. Unfortunately most of these officers have all their time taken up supporting farmer groups and cannot contribute to enhancing the role of local government in natural resource management. To undertake a greater role in natural resource management and salinity management, local government will require the capacity to focus on the regional perspective and big picture issues.

Local government currently has a system of regional groupings in the form of the ward system of the Country Shire Councils Association. These will become Country Zones when the Country Shire Councils Association, Western Australian Municipal Association and the Local Government Association combine to form the new Western Australian Local Government Association. With some resourcing, these Zone groups could be strengthened to contribute more substantially to the natural resource management regional groups. The current arrangements in the Moore River sub-region where all the local government authorities are involved provide a good model. New South Wales also has a strategy for working with local government, which could provide some guidance for Western Australia.

Recommendation 5.5.17

The Salinity Taskforce recommends that the proposed Natural Resource Management Council for Land and Water and the proposed Natural Resource Management Office work with the local government associations in Western Australia to develop a regional model for local government to work in partnership with the natural resource management regional groups, including dedicated resources and staff to enable local government authorities to make a meaningful contribution to natural resource management issues in the regions.

Another concern raised by the Western Australian Municipal Association was the lack of involvement in negotiations with the Commonwealth Government over major natural resource management funding programs, especially the National Action Plan for Salinity and Water Quality. Local government, as the third tier of government, should be involved in such negotiations. A perceived lack of integration across government at all levels was also raised. These concerns should be addressed by all of the recommendations for a more integrated approach to Natural Resource Management that are made in this report, as long as local government plays an active role in the structures and processes that will result if they are implemented.

Engineering works have received considerable attention in other parts of this report and the Western Australian Municipal Association emphasises that such works will become increasingly important for local government, as it tries to manage the impacts of salinity on infrastructure, particularly on roads and buildings. Some local governments in Western Australia have undertaken engineering solutions, such as lowering culverts and improving floodways, but much more needs to be done.

The Taskforce has discussed this important issue elsewhere in the report (see Section 5.3) and has made a recommendation for the Department of Planning and Infrastructure to work in collaboration with local government to develop a program to assess the extent of the problem with roads (see Recommendation 5.6.13). The Rural Towns Program, which is discussed in Section 5.6, deals with infrastructure in rural towns, and local government is taking a strong role in this program.

Recommendation 5.5.18

The Salinity Taskforce recommends that engineering works where local government is involved be coordinated with appropriate leadership by local government authorities.

The Western Australian Municipal Association submission to the Salinity Taskforce made a number of other useful suggestions and recommendations. These should be passed on to the proposed Natural Resource Management Council for Land and Water for further discussion with local government as part of the partnership approach that is recommended in this report.

What people said about manaing salinity's impact on biodiversity, public assets & communities

"We appreciate that, given limited resources, strategic decisions must be made in terms of what public assets (or private assets where there is sufficient public interest) shall receive a particular level of protection. However, we stress that, with the vast majority of the south-west agricultural region already cleared of its native vegetation, biodiversity values must receive a high priority in the allocation of public resources for salinity prevention and management."

Australian Conservation Foundation

"If the community is to contribute anything to the cost of salinity, or the cost of keeping farmers on the land, they will need a good reason. In years to come, once the community becomes aware of our biodiversity, this will be the reason they will be willing to contribute to problems such as salinity."

David Rees Farm Consultancy Service

"Landowners who are caring for native bush, remnant vegetation or re-growth of bush by fencing off from stock should not have to pay land rates to local Shires, this should be paid for the by the Federal Government, to encourage more farmers to do likewise."

Wyalkatchem LCDC

"There needs to be acceptance that the state will have a significant area of salt affected land, which needs to be managed profitably, if possible, but certainly in a way which minimises off-site impacts. The long-term consequences of another two to four million hectares being affected by salinity on the economy per se are not great compared to the effects of declining terms of trade, adverse seasons and disease and pest outbreaks. The threat to agriculture will be community demands that off-site impacts of salinity are controlled."

Department of Agriculture.

"It seems reasonable to argue that the economic returns from programs with a general bias towards widespread restoration and even protection of agricultural lands would be very small indeed when compared to programs aimed at protecting, and even restoring, areas of high investment such as towns and transportation corridors. Furthermore, since many more people would benefit, whether they be in the towns (and indeed cities) or in the countryside, there would be a more equitable allocation of these public funds. I would therefore argue that the bulk of expenditure should be in the area of infrastructure protection."

H. M. Churchward

5.6 Managing Salinity's Impact on biodiversity, public assets and communities

5.6.1 Biodiversity and environmental assets

Term of Reference 1.8 required the Taskforce to examine mechanisms to support biodiversity protection. This has partly been addressed in the section on "Community Support, Capacity Building and Mechanisms to Encourage Change" in relation to Term of Reference 1.7: Mechanisms to encourage adoption of improved land management practices. This section addresses mechanisms and programs that are specifically concerned with biodiversity.

Western Australia has outstanding biodiversity of international significance and a significant proportion of it is under serious threat from salinity. The 2000 State Salinity Strategy recognised the need to provide additional measures for protection and management of native vegetation.

While good progress has been made in initial recovery catchments, resource limitations have meant that some outstanding environmental assets are still under serious threat.

The Department of Conservation's Biodiversity Survey Program has been of great significance in revealing the exceptional biodiversity of south west Western Australia. In addition, this Department's wetland monitoring program provides one of the few sources of information about environmental impacts from salinity over the long term. The Taskforce considers that continuation of both these programs should be a high priority for the State.

Further, the valuable information obtained by the Department of Conservation, through its surveys and monitoring, together with complementary work by CSIRO, should be used to develop a strategy for nature conservation, native vegetation and biodiversity on public and private lands across the south west of Western Australia.

The work of Greening Australia, Western Australia and Kings Park Botanic Gardens in developing seed storage systems to preserve the genetic diversity of the state are initiatives that should also continue to receive support.

Recommendation 5.6.1

The Salinity Taskforce recommends that very substantial additional funding be allocated to the Department of Conservation for the protection of specific, highly valuable environmental assets through the Natural Diversity Recovery Program subject to consistency with the principles of the Investment Framework.

Recommendation 5.6.2

The Salinity Taskforce recommends that the Department of Conservation establishes a Working Group to develop a Nature Conservation, Native Vegetation and Biodiversity strategy for public and private lands across the south west of Western Australia. Development of the strategy should involve the other natural resource management departments, farmers, local government, CSIRO, Greening Australia, the World Wide Fund for Nature and the Conservation Council. It should be endorsed by the Conservation Commission, the proposed Natural Resource Management Council for Land and Water and the Cabinet Standing Committee on Environmental Policy.

The Native Vegetation Working Group was established to address the protection of native vegetation on private lands. The previous Government adopted the recommendations of the Working Group in October 2000 and the Taskforce received many submissions that called for the recommendations to be implemented. However, implementation has been slow because of limited resources.

There remain a number of important impediments to private investment in bushland conservation. For example, conservation management of bushland still attracts high levels of rates and taxes, particularly for the non-farmer. This is clearly not in the best interests of the community and the Taskforce therefore recommends that the Government implement the following recommendations which reflect key findings of the Native Vegetation Working Group.

Recommendation 5.6.3

The Salinity Taskforce recommends that very substantial additional funds be allocated among the five natural resource management regions to fund incentives that assist land managers to protect and manage native bushland.

Recommendation 5.6.4

The Salinity Taskforce recommends that substantial additional funds be allocated to part fund four "Conservation Brokers" able to "case manage" land managers and catchment groups to assist them to access and utilise opportunities to protect and manage native bushland.

Recommendation 5.6.5

The Salinity Taskforce recommends that additional funds be allocated to assist local authorities introduce rate relief schemes for private bushland in rural areas.

Recommendation 5.6.6

The Salinity Taskforce recommends that substantial additional funds be allocated to the Department of Conservation for the continuation of the Land for Wildlife Program.

Recommendation 5.6.7

The Salinity Taskforce supports the removal of State and Commonwealth taxes that discourage private

investment in bushland conservation, with the State Government taking the lead in removing such taxes and lobbying the Commonwealth Government to do the same.

Recommendation 5.6.8

The Salinity Taskforce recommends that more flexible planning policies and procedures be promoted to assist in placing large areas of bushland into saleable parcels, such as the interim Subdivision for Conservation Policy and the proposed Statement of Planning Policy on rural land use planning.

Land clearing has diminished, but not disappeared, as an issue in rural Western Australia. It has been argued to the Taskforce that existing legal protection measures against clearing are inadequate.

This recommendation is linked to the earlier recommendation on better use of existing natural resource management legislation.

Recommendation 5.6.9

The Salinity Taskforce recommends that the Government strengthen regulations against vegetation destruction where adverse environmental outcomes are likely to occur and that enforcement of existing and new regulations are strongly enforced.

5.6.2 Water resources

Water Resource Recovery Catchments were established within the 1996 Salinity Action Plan. Currently, the Department of Environment, Water and Catchment Protection is preparing situation statements for each of the Water Resource Recovery Catchments. The aims are (a) to ensure that adequate resources are provided to those catchments where water quality targets can be met and (b) reconsider the inclusion in the Water Resource Recovery Catchment program of those catchments where it appears water quality targets will not be met.

Recommendation 5.6.10

The Salinity Taskforce endorses the approach being taken by the Department of Environment, Water and Catchment Protection of reviewing the current status and future prospects of catchments currently included in the Water Resource Recovery Catchment program.

Relatively little is known about the impacts of rising water tables on flood risks across the south west, although expectations are for substantially increased flood flows in many catchments.

It is intended that flood risks should be assessed within the engineering investigation initiative, and particularly by the proposed initiative for a new modelling tool for predicting flood peaks, salt flows and loads (see Section 5.3.1).

5.6.3 Infrastructure, including rural towns

The Taskforce is impressed with the Department of Agriculture's Rural Towns Program as a well-designed and well-conducted activity. It has much better defined the salinity problems facing rural towns and has changed perspectives on the types of interventions needed to address these problems. It has highlighted that, as with agriculture, living with salinity may be a preferable strategy in some towns, in view of the very substantial costs of salinity prevention. The existing investigations of pumping, desalination and safe disposal at Merredin are particularly important in their potential contributions to future salinity management efforts in the towns.

Recommendation 5.6.11

The Salinity Taskforce recommends that the Rural Towns Program be continued as a high priority.

Recommendation 5.6.12

The Salinity Taskforce recommends that a future priority for the Rural Towns Program be the investigation of cost-effective methods for living with salinity (e.g. low cost repair methods for infrastructure, methods to make infrastructure more resistant to the impacts of salinity) as well as methods to reduce the costs of salinity prevention (e.g. cheap disposal of saline water from pumps within towns). The Rural Towns Program should work with the Engineering Investigation Initiative on the issue of safe and cheap disposal.

Roads and rail have been highlighted in recent projections as being amongst the highest costs items as salinity continues to increase in Western Australia. The State Salinity Strategy will prevent some of the projected impacts, but significant levels of damage are unavoidable. Issues addressed by the program should include use of verge vegetation and engineering works to reduce salinity damage, impacts of roads on water flows, and damage to roads from increased salinity. After the first year, funding should be conditional on matching funds from local government authorities.

Recommendation 5.6.13

The Salinity Taskforce recommends that the Department of Planning and Infrastructure develops a new Rural Roads Program, in collaboration with the Western Australian Local Government Association, to identify salinity and flooding issues related to roads on a medium to long term planning basis. Investigations should include the potential for investing in land outside the road reserve to solve salt, water and silting problems.

Recommendation 5.6.14

The Salinity Taskforce recommends that the Government makes provision in longer-term budget projections for substantially increased costs of maintaining and repairing public infrastructure, particularly roads and rail.

5.6.4 Health, welfare and well-being

Salinity is adding to the stresses of life in rural areas

in a number of ways. The Taskforce notes that adoption of salinity treatments on the scale needed to be effective against salinity will probably have even greater impacts on rural communities than will salinity itself. The Taskforce recommendations regarding industry development are designed to ensure that those social impacts will be primarily positive, through generation of wealth and new employment in rural areas. Nevertheless, the potential for negative social impacts also exists, as has been found in some locations in the south-west where blue gum plantations have been established over large proportions of what was previously farm land, resulting in at least local population reductions.

Recommendation 5.6.15

T*he Salinity Taskforce recommends that the Development Plan for New Regional Industries attempts to ensure that new industries on agricultural land enhance social benefits and minimise adverse social impacts.*

Initiatives to identify and manage the social impacts of salinity and salinity management practices have recently commenced. The Department of Agriculture has established a project to address social impacts and to ensure that the technical programs of the Department are sufficiently aware of relevant social issues. The Cooperative Research Centre for Plant-Based Management of Dryland Salinity has a program titled 'Economic and Social Assessment' which includes leading national researchers on social aspects of natural resource management. The Cooperative Research Centre program and the Department of Agriculture project are operating collaboratively. A greater knowledge and awareness of social aspects of salinity will result from these initiatives, (and other ongoing work in this area) and should allow the human dimension of salinity to be better considered in future programs.

Salinity has contributed to pressures on farmers to leave the industry. However, the Taskforce considers that few farmers would count salinity as being amongst the main threats to their farm business viability. Market and climatic pressures are far more significant for most. Nevertheless, the Taskforce considers that the salinity-specific pressures on rural adjustment should be reviewed to consider whether specific initiatives are needed to address the rural adjustment consequences of salinity.

Recommendation 5.6.16

The Salinity Taskforce recommends that the Department of Agriculture review the salinity-specific pressures on rural adjustment, to consider whether specific initiatives are needed to address the rural adjustment consequences of salinity.

What people said about future investment directions for salinity

"The level of response is severely inadequate. Technical support necessary for planning is severely lacking in Yilgarn. Management support and technical resources are available for priority catchments such as focus catchments (Bodallin) and recovery catchment groups, however this can be at the detriment of the whole community with technical staff having little time left over for other catchments."

Yilgarn LCDC

"The Quairading LCDC believe that there need to be significant changes to the current funding system as it exists at the present. ... the LCDC believe that more money needs to be directed towards on-ground projects at a larger scale, appropriate for managing a district as a whole. The LCDC also believe that the funding concentrates too heavily on the protection of biodiversity. Whilst recognising the large public benefits that this has, the LCDC believe that there needs to be more funds directed towards drainage and conservation earthworks if we are make a difference to salinity management."

Quairading LCDC

"The model used to allocate funds from the various sources...is flawed in that the scales of the allocation have been woefully inadequate for the works required, leaving the only alternatives for most of the funds to be used for poor quality planning, or on small scale demonstrations (which have limited applicability). The process of allocation by using local, regional, state and national assessment panels means that whoever is at the table has determined the allocation of funds and the money has been spread "like vegemite" across the landscape...The process of allocation of public funds needs to be completely re-designed after adequate planning has indicated the level of returns to alternative investments."

NRMC Pty Ltd

"Inadequate money is being allocated. New funding mechanisms need to be investigated. Tax write-offs are the most attractive to most Australians. Investment in landcare work where there is no return but significant tax benefit would be attractive."

Sinclair Knight Mertz

"Our recommended allocation of future funding places greater emphasis on engineering solutions, developed from existing data, supported by agronomic management measures, in order to achieve targeted advances in salinity management. We also advocate greater research on social adjustment and the effects of government and institutional policy on salinity management. Current data acquisition/research programs would continue, but with reduced emphasis and directed to monitoring progress from the measures implemented as part of the remediation programs."

Brown & Root

6. Future Investment Directions for Salinity

This section responds to Term of Reference 2. The Taskforce has concluded that the existing level of response to salinity in Western Australia does not sufficiently reflect the scale of the problem, particularly as we are now more aware of the greater threat to public assets such as biodiversity.

Accordingly the Taskforce has identified a number of actions that are not currently funded or that require additional funding and these are articulated within the recommendations previously outlined.

It is the strong view of the Taskforce that the State should endeavour to secure funding under the National Action Plan for Salinity and Water Quality for all of these initiatives.

The funding gaps are listed below and grouped to indicate the scale of investment that the Taskforce considers is necessary.

Very substantial additional funding

- Expansion of the Department of Conservation's Natural Diversity Recovery Program (5.6.1).
- The development of economically viable new management technologies and the establishment of new industries and markets based on those technologies (5.3.1).
- Funding to assist landholders to protect and manage native bushland (5.6.3).
- Core support for natural resource management regional groups (5.5.15).

Substantial additional funding

- Finalisation and application of the Framework for Investment in Salinity Management (5.2.1).
- Development and implementation of a comprehensive and cost-effective monitoring and evaluation program for salinity and natural resource management (5.2.2).
- Continuation of the Land Monitor Program (5.2.7).
- Research and development to enhance germplasm of perennial pastures (5.3.11).
- Additional research and development for commercial Acacia species for wood products and feed (5.3.12).
- Product testing and development for eucalyptus oils derived from oil mallees and other eucalypt species (5.3.13).
- Financial support to encourage oil mallee planting during 2002 (5.3.14).
- Research and development to improve germplasm for salt land and development of new types of commercial salt tolerant plants (5.3.15).
- Funding 'conservation brokers' to assist land managers to access and utilise opportunities to protect and manage native vegetation (5.6.4).
- Assistance to local authorities to introduce rate relief schemes for private bushland in rural areas (5.6.5).
- Continuation of the Land for Wildlife Program (5.6.6).

Additional funding

- Development of a modelling tool to allow improved analysis of flood peaks, salt loads and flows (5.3.6).
- Establishment of a program to evaluate the commercial potential of options for making productive use of salt water (5.3.16).
- Development of a coordinated training and education program available to all extension officers and advisers involved in salinity and natural resource management (5.4.6).
- Further development of inland saline aquaculture and coordinated approach to industry development (5.3.17).

Conclusion

The Salinity Taskforce has reviewed Western Australia's current direction in salinity management and, at the same time, considered emerging opportunities and identified issues which are currently not receiving adequate management or funding. In its report, the Taskforce has highlighted a number of key issues, including institutional and structural reform, decision-making processes for strategic investment and community and regional development opportunities. The majority of the recommendations presented in this report reflect views presented to the Taskforce in submissions throughout the three months of the Taskforce review. However, the final recommendations are the responsibility of the Taskforce. It is our view that considered and strategic investment in salinity, as recommended in this report, will increase Western Australia's capacity to meet the challenges which salinity presents to the State.

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Appendix 1

List of submissions to the Salinity Taskforce

Ms Diana Phillips, Pristine Ecoscene Ltd

Mr David Williamson, David Williamson Consulting

Mr Brian Whittington, WISALTS Inc.

Dr David Bennett, NRMC Pty Ltd

Mr Viv Read, Viv Read & Associates

Mr Mick Poole, CSIRO Centre for Mediterranean Agricultural Research

Mr Peter Henning, Cadoux/Manmanning LCDC

Dr Paul Biggs, Forest Products Commission

Mr Michael Carmody, Salinity Drainage and Management Association Inc.

Mr F. W. Armstrong, Katanning LCDC

Ms Felicity Morel-EdnieBrown, W.A. Sandalwood Farmlands

Mr Jonathan Thomas, Resource Economics Unit

Ms Rosanna Hindmarsh, Chittering Landcare Centre

Professor Philip Cocks, CRC for Plant-based Management of Dryland Salinity

Mr J Pulbrook, Morawa LCDC

Mr Roger Doyle, Audax Enterprises Pty Ltd

Mrs Franscine Boyne, Koorda LCDC

Mr Les Last

Mr Laurie Adamson, WISALTS Inc.

Mr Bernard Bowen, Environmental Protection Authority

Mr Paul Ensor

Dr Rob Kelly, CSIRO Livestock Industries

Mr David Williamson, David Williamson Consulting

Mr Twynam Cunningham, Tunney LCDC

Mr John Battaglia, Kalannie LCDC

Mr Kevin Hutchings, Toodyay LCDC

Ms Jan Star, Peel-Harvey Catchment Council

Mr Rod Bradley

Mr Colin Purcell, Goldfields Esperance Development Commission

Mr Justin Taylor, Gordon River Catchment Group

Dr Sarah Lumley Department of Agricultural and Resource Economics, University of Western Australia

Mr David Singe, Wheatbelt Region Development Commission

Mr John McDougall

Mr Ted Rowley, Amron Consulting Pty Ltd

Mr Simon Abbott

Ms Louise Duxbury, Green Skills

Ms Faye Christison, Cunderdin and Tammin Shires

Mr Eddie Garner, Wyalkatchem LCDC

Mr Barrie Oldfield OAM, Men of The Trees

Dr Tom Hatton, CSIRO Land and Water

Mr Max Hudson

Mr Des O'Connell

Mr Jim Limerick, Department of Mineral and Petroleum Resources

Mr Alex Campbell, State Salinity Council

Mr David Leake, Kellerberrin LCDC

Ms Rachel Siewert, Conservation Council of Western Australia Inc.

Mr Owen Dare, Dumbleyung Landcare Zone

Mr John Longman, West Koojan-Gillingarra LCDC

Mr Barry Oates, Geocatch

Mr Jeff Patterson

Mr Clive Malcolm, Saltland Pastures Association

Mr Clive Malcolm

Dr Ed Barrett-Lennard, Centre for the Management of Arid Environments

Mr Fred Bremner JP, Soil Conservation Services

Dr Robert Lambeck, Greening Australia Western Australia

Ms Christine Wardell-Johnson, Natural Resource Management Regional Chairs Group

Mr Don Woodcock

Dr Paul Vogel, Department of the Premier and Cabinet

Mr Harvey Morrell

Mrs Jean Webb

Ms Peta Whitaker

Mr Andrew Thomson

Mr Michael Grasby, Swan Catchment Council

Mr Greg Street, Sinclair Knight Merz

Ms Pip Crook, Gillamii Landcare Centre

Mr Wes Horwood, Brown and Root

Ms Jan Star

Mr Glenn Dale, Saltgrow Pty Ltd

Mr Barry Oates, South West Catchments Council

Mrs Diana Lapsley

Mr Ian Longson, Department of Agriculture

Dr Wally Cox, Department of Conservation and Land Management

Mr Jasper Trendall, Sea Dragon Farm

Ms Paula Deegan, South Coast Regional Initiative Planning Team

Ms Michelle Smart, Yilgarn LCDC

Professor Syd Shea, Oil Mallee Company

Mr David Chadwick

Mr James Duggie, Wildflower Society of WA Inc.

Ms Robyn Cail, Liebe Group

Mr Badger, Nyabing Pingrup LCDC

Mr Geoffrey Marshall, Western Australian No-Tillage Farmers Association (Inc)

Ms Elizabeth Eaton, Moore Catchment Council

Mr Rick West, West Maya LCDC

Dr Susan Moore, Murdoch University

Ms Jane Madgwick, WWF Australia

Mr Roger Payne, Water and Rivers Commission

Mr Andy McMillan, The Western Australian Farmers Federation (Inc)

Mrs Barbara Morrell, Avon Working Group

Mr J Ferguson, Ferguson, Kenneison and Associates

Ms Gina Broun, Cuballing LCDC

Mr Lyn Messenger

Mr Graeme Baesjou, Midwest Development Commission

Mr Campbell Ansell, Conservation Commission Western Australia

Mr Don Punch, South West Development Commission

Ms Pamella Toster, West Ballidu LCDC

Mr J Gill, Water Corporation

Mr Eddie Garner, Wyalkatchem LCDC

Dr L Pyke, Salinity Drainage and Management Association Inc.

Ms Dee Margetts, MLC for the Agricultural Region

Dr Christine Sharp, MLC for the South West

Mr Bruce Manning, Great Southern Development Commission

Mr S Fraser, Gingin Shire

Ms Claire Jordan, BP Refinery (Kwinana) Pty Ltd

Mr Simon Abbott

Mr Rolf Meeking, Hyden-Karlgarin LCDC

Ms Anne Jennings, West Australian Women in Agriculture Inc

Ms Lisa Shreeve, Wheatbelt Area Consultative Committee

Mrs Diana Van Buerle

Mr Max Churchward

Mr Alex Campbell, State Assessment Panel

Mr Nathan McQuoid, Greening Australia (WA)

Ms Nicole Hodgson, WA Municipal Association

Mr Denam Bennetts

Mr Maurice Barnes

Mr Graeme Olsen, Olsen & Vickery

Ms Rebecca Carter, NAIMS

Mrs Irene Stokes

Mr David Rees, David Rees Farm Consultancy Service

Mr Rick Hurst, Bremer Bay Suite of Wetlands Community Group

Mr Garry Middle, City of Rockingham

Mr Mike McFarlane

Mr John Hall, Hall Drainage

Ms Monica Durcan, Landcare Promotions

Mr John Dunne

Dr David Bennett, NRMC Pty Ltd

Mr Brian Doy, Alcoa World Alumina Australia

Mr Corey Watts, Australian Conservation Foundation

Mr Colin Anderton, Anderton Enviro Corp

Ms Juana Roe, Department of Agriculture

Mr Richard Moore, Department of Conservation and Land Management

Mr Angas Hopkins

Mr Adrian Vlok, BSD Consultants

Ms Jeanette Conacher

Professor John Lovett, Grains Research and Development Corporation

Cr Jack Fox

Ms Margaret Carmody

Mrs Betty Heitman

Appendix 2

List of Attendees at Public Meetings

Jerramungup - 9 July 2001
Arjen Ryder
Brett Ward
Ian Peacock
Alan Danks
Rex Edmondson
Val Edmondson
Carolyn Daniel
Naomi Arrowsmith
Paula Deegan
Ross Williams
Ruth Speldewinde
Therese Bell
Louise Duxbury
Lawrie Walter
David Hancock
Fred Armstrong
Giles West
Graeme Jones
Anne Spencer
Serena Stevens
Geoff Bee
Richard Grant
Rob Johnstone
Jim Saunders
Gussie Saunders
Jenny Chambers
Rod Ebert
Dorothy Redreau
Lucy Skipsey
Jennifer Langmead
John Simpson
Rochelle Strahan
Hayley Turner
David Rees
Gary Featherstone
Peter Wilkins

Boyup Brook - 10 July 2001
Karen McKeough
Peta Whitaker
Des O'Connell
Peter Beatty
Saan Ecker
Brian O'Hehir
Mick Murray
Kevin Moir
Shirley Broadhurst
Ian Purse
Simon Purse
John Mondy
Les Bardok
Grant Wardle
Tom Muir
Ned Rees
Billie Hills
Martin House
Richard George
David Williams
Owen Dare
Lynda Coote
Danny Schofield
John Platt
Sasha Taylor
Barry Oates
Richard Moore
Alice Karafilis
Glenn Batty
Wayne Tingey
Keith Nix
Andy McElroy
Roger Hearn
Greg Hales
Clark Ward
Jill Karena
Ryan Taylor
Paul Raper
David Chadwick
Eric Wright
Ivan Wunnenburg
Malcolm Gooding
Jan Gray
Chris Evans
Mark Samwell

Merredin - 11 July 2001
David Auld
Ray Della Bosca
Sue Bosenberg
Sarah Gardner
Helen Dubar
Diana Lapsley
Travis Cattlin
Tanya Kilminster
Rob Edkins
Joe Crook
John Dunne
Rosemary Nott
Mal Harper
Mike Kelly
Juana Roe
Ed Barrett-Lennard
Mark Pridham
Maurice Barnes
Rachel Storer
Faye Christison
Greg Wahlston
Chris Barnett
Don Woodcook
Denam Bennetts
John Jefferys
Dinny Lane
Toll Temby
David Leake
Barrie Bywater
Ken Wallace
Emma Withers
Les Last
Kevin Cahill
Kevin Jones
Merrilyn Temby
Cecilia McConnell
Mike McFarlane
Brian Whittington
Laurie Adamson

Three Springs - 12 July 2001
Mike Barr
Robyn Stephens
Emma Scotney
John Allen
Jessica Johns
Andrew Moore
Chris King
Debbie Patterson
Yvonne Marsden
Jamie Falls
Natalie Bort
John Pulbrook
Lyn Rheinlander
Ian Pulbrook
Ryan Mincham
Robyn Cail
Cliff Harding
Bill Lullfitz
Russell Speed
Jackie Healy
Jack Satchell
Ron Shepherd
Des Counsel

Kelly Gillen
Mark Pendelbury
Duncan Peter
Anthony Desmond
Trevor Haeusler
Jim Bligh
Peter Whale
Nadine Morgan
Diana Van Buerle
Dee Margetts
Graham Haeusler
Rob Weir
Rebecca Carter
Max Hudson
Mike Clarke

Perth - 13 July 2001

Kaye Pearson
Peter Pearson
Michael Sanders
Lillias Bovell
Angus Belford
Rob Bradley
Linda Kirchner
Margaret Smith
Brian Lloyd
Tim Perkins
Dr Pyke
Jennifer Warburton
Cr Jack Fox
Jeremy Dunnette
Peter Wahlsten
Michael O'Dea
Mike Grasby
Robyn O'Grady
Greg Street
Simon Abbott
Garry Middle
Wes Horwood
Shelley Shepherd
Andrea Zappacosta
Monica Durcan
Jeanette Conacher
Judith Scott
Brian Moyle
Mary Gray
Dr Rob Kelly
David Bennett
Sarah Males
Raymond Matthews
Rob Hammond
Liz Yuncken
James Duggie
Sandra Franz
Paul Turner
Louise Stelcox
David Mitchell
Viv Read
Andrew Thompson

Esperance - 7 August 2001

Ruth Kirchner
Ted Young
Ward McIntyre
David Johnson
Garry English
Phil Charmer
Des Neave
Jamie Bowyer
John Simons
Marg Agnew
David Hall
Vanessa Johnson
Rod Johnstone
Brigitte Wallefield
David Beard
Marjorie Stephen
David Spittle
Tom Quirk

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