Australian Government

Land & Water Australia

knowledge for managing Australian landscapes

Annual Operational Plan 2006-07

CONTENTS

1. Land & Water Australia's Mandate

The legislative base

Land & Water Australia (formerly and legally the Land and Water Resources Research & Development Corporation) is a statutory corporation established under the Primary Industries and Energy Research and Development *(PIERD) Act 1989*, within the Australian Government's Agriculture, Fisheries and Forestry portfolio. The Corporation focuses its activities on the four objects of the PIERD Act:

1. Achieving the sustainable use and sustainable management of natural resources;

2. Increasing the environmental, social and economic benefits to primary industries and the community;

3. Making more effective use of the resources and skills of the scientific and general community; and

4. Improving accountability for Research and Development (R&D) expenditure.

Strategic approach

Land & Water Australia (LWA) is specifically responsible for research and development aimed at the productive and sustainable management of the land, water and vegetation resources underpinning Australia's primary industries and regional communities. The Corporation has a particular charter to foster national collaboration in order to improve the efficiency and effectiveness of this R&D effort. The Corporation emphasises the establishment of national research programmes, supported jointly by numerous partner organisations, which bring together resource managers, policy developers, resource users and researchers to identify research priorities and to ensure that research findings are adopted and implemented.

Of the many agencies involved in NRM R&D at the national level, Land & Water Australia is distinctive in several ways:

- Our interests are not constrained by any particular commodity, region, discipline or research provider.

- Our research investments range across the biophysical and social sciences.

- As the host agency for the National Land and Water Resources Audit, the Corporation is well placed to link the best available data and information to its research funding and management.

We have a very broad mandate, with a modest appropriation. This demands a strategic approach to target our investments and to attract partnership funding to the most critical issues, in ways that will maximise the influence and return on investment of our core funding. The key activities that comprise our strategic approach include:

- Funding innovative, inter-disciplinary and integrated research that meets Australia's primary NRM knowledge needs and creates new opportunities for Australia's farmers, rural communities and future generations.

- Brokering partnerships between primary industries, management agencies, research providers and customers by converting research needs into research questions, linking to appropriate research providers, managing research efficiently, evaluating impact, managing knowledge assets and establishing effective adoption pathways.

- Scanning and scoping future research priorities and opportunities, informed by analyses of trends and drivers of future change and the business environment.

2. Responding to the National Research Priorities & Rural Research Priorities

National Research Priorities

In December 2002 the Prime Minister announced the four National Research Priorities and their associated priority goals:

1. An Environmentally Sustainable Australia

2. Promoting and Maintaining Good Health

3. Frontier Technologies for Building and Transforming Australian Industries

4. Safeguarding Australia.

Land & Water Australia's charter fits clearly into the first priority, but all the other priorities are important to our strategic thinking and investment analyses.

The goals of the first National Research Priority relevant to Land & Water Australia are:

- *Water* - a critical resource - ways of using less water in agriculture and related industries, providing increased protection of rivers and groundwater and the re-use of urban and industrial waste waters.

- *Transforming existing industries* - new technologies for resource-based industries to deliver substantial increases in national wealth by reducing environmental impacts on land and sea.

- *Overcoming soil loss, salinity and acidity* - identifying causes and solutions to land degradation using a multidisciplinary approach (eg incorporating hydrology, geology, biology and climatology) to restore land surfaces.

- *Sustainable use of Australia's biodiversity* - managing and protecting Australia's terrestrial and marine biodiversity to develop long-term use of ecosystem goods and services ranging from fisheries to ecotourism.

- *Responding to climate change and variability* - increasing our understanding of the impact of climate change and variability at the regional level across Australia, and addressing the consequences of these factors on the environment and on communities.

Rural Research Priorities

In March 2003, Senator Troeth wrote to all R&D Corporations outlining the Government's priorities for rural research to increase the competitiveness and improve the sustainability of Australia's rural industries.

Land & Water Australia's planned key actions to address the National and Rural Research Priorities in 2006-07 are presented in Table 1.

Table 1. Implementing The National and Rural Research Priorities

National Research Priority 1

An environmentally sustainable Australia

Rural Research Priority A

Sustainable natural resource management

This priority is core business for Land & Water Australia. The following key actions are planned for 2006-07.

Water - a critical resource

Land & Water Australia will continue its R&D investment in Australia's irrigation industries, seeking to continuously improve system and on-farm water use efficiency, irrigation productivity and the health of river systems. In 2006-07, extensive consultation with farmers, rural industries and water managers will help to identify future R&D priorities to build on 14 years of effective irrigation research and adoption.

Two important new directions for water research will be consolidated - environmental water allocation and tropical rivers. The former aims to support decision-making around the management and evaluation of environmental water both within the Living Murray initiative and for river systems outside the Murray-Darling Basin. Tropical rivers will for the first time focus research on improving understanding of northern Australia's riverine ecosystems to support their sustainable use, protection and management in an integrated manner. In addition, social and institutional research will be funded to support the National Water Initiative.

Research needs regarding future climate variability and climate change effects on water resource management in Australia will be carefully analysed as we plan future R&D for the Managing Climate Variability Programme.

Land & Water Australia will also be promoting a range of outputs from concluding programmes, particularly in the areas of managing river contaminants (sediments, salinity and nutrients) and managing riparian lands.

Transforming existing industries

Farming systems including grazing enterprises, grain growing, horticulture, dairy and cotton will be further developed to improve on-farm productivity whilst at the same time contributing to catchment and regional NRM targets and priorities.

Wool growers will have full access to the results of the Land, Water and Wool programme which aims to improve productivity by at least $58m and deliver $46m in environmental benefits.

New insights into advancing the mixed farming sector will allow for significant improvements in productivity whilst controlling salinity, improving soil health and promoting conservation of biodiversity.

A new range of seasonal forecasting and tools for managing climate variability on farms will be refined and promoted to farmers.

Work relevant to sustainable irrigation in Northern Australia will seek to develop a decision-making framework based on ecologically sustainable development to identify the attributes of a sustainable irrigation system in the North.

Overcoming soil loss, salinity and acidity

The Healthy Soils for Sustainable Farms programme will target soil health issues such as soil structure, erosion, nutrients, salinity and biology with farming groups, state agencies, and regional/catchment bodies. Adoption of sustainable farming systems will be promoted which includes reduction of soil loss and managing the movement of water within the soil.

The Sustainable Grazing on Saline Land component of the Land Water & Wool programme is tackling both salinity and soil loss by ensuring the availability of profitable solutions for establishing and maintaining vegetative cover on salt-affected land.

Research to build better understanding of the movement of salt within the root zone will continue in collaboration with irrigated commodities such as grapes and horticulture.

Sustainable use of Australia's biodiversity

A new R&D initiative on Native Vegetation & Biodiversity is being implemented, focussing on better utilising and managing Australia's native vegetation and biodiversity resources to support their sustainable use and management and to deliver ecosystem goods and services. At the same time, outputs from the previous nine years of R&D on native vegetation will be synthesised and promoted in collaboration with Greening Australia.

A new phase of the Joint Venture Agroforestry Programme (2004-09) is focussing on achieving commercial industries and targeted environmental outcomes through providing the tools and techniques to engage investors, rural advisors and regional NRM groups.

Healthy soils investments will build knowledge and understanding of the role of soil biology and biodiversity in sustainable production and NRM.

Knowledge and understanding about the contribution that native pasture systems make to sustainable wool production will be extended. This includes synergies which have been identified between grazing and the persistence of sensitive native species.

Responding to climate change and variability

The Managing Climate Variability Programme will be investing in better seasonal climate forecasting tools and use of climate risk management to increase the ability of farmers and natural resource managers to deal with seasonal variability and adapt to the impacts of climate change.

A number of applied research and demonstration projects will involve farmers and NRM managers in testing and proofing seasonal forecasting and risk management tools.

National Research Priority 2

Promoting and maintaining good health

A ground-breaking project within the Social and Institutional R&D Programme through Charles Darwin University is researching the links between individual and community health in remote Aboriginal communities, and the quality of natural resources and their management. Initial findings suggest that these issues are closely linked. Research in 2006-07 will tease out these inter-relationships.

A number of programmes seeking improvements in environmental quality and farm profitability will contribute to the health and welfare of rural communities.

Rural Research Priorities B,C,D

Improving competitiveness through a whole of industry approach

Maintaining and improving confidence in the integrity of Australian agricultural, food, fish and forestry products

Improved trade and market access

A range of Land & Water Australia programmes, particularly those funded through the Industries Arena, will improve long term industry competitiveness by assisting industries to better meet changing community and consumer expectations about the sustainability of their production systems.

National Research Priority 3

Frontier technologies for building and transforming Australian industries

Rural Research Priority E

Use of frontier technologies

Land & Water Australia will continue to support the application of frontier technologies, often developed in fundamental disciplines, to help solve natural resource management problems. This is achieved through the annual call for high innovation projects (Innovation Call) which has been successful in attracting new and novel combinations of existing technologies. Technological advances coming to fruition in 2006-07 include molecular diagnostics for soil health and landscape biotechnologies of the future.

A major new $7m initiative in climate science between Land & Water Australia (on behalf of the Managing Climate Variability Programme), the Murray-Darling Basin Commission, Australian Greenhouse Office and the Victorian Department of Sustainability and Environment will be investing in the downscaling of Global Climate Models to develop scenarios for the impact of climate change on water resources in the Murray-Darling Basin. The work is expected to also generate new capacity in the next generation of seasonal climate forecasting tools for farmers and water resource managers.

Rural Research Priority F

Creating an innovative culture

Land & Water Australia has Innovation as one of its four R&D Arenas. This arena specifically seeks out and supports more radical and innovative research – seeking 'outside the square' solutions and supporting proof-of-concept work to identify potentially fruitful areas of innovation. It also supports a range of scholarships and fellowships to build R&D capacity in natural resource management.

Through collaborative initiatives with sister research and development corporations, innovative approaches to achieving sustainable production and NRM outcomes are fostered. A collaborative approach "pushes the boundaries" of investors beyond traditional investments.

National Research Priority 4

Safeguarding Australia

Rural Research Priority G

Protecting Australia from invasive diseases and pests

Land & Water Australia manages the research component of the Defeating the Weeds Menace programme which will commence in earnest during 2006-07. It will focus on weed issues across Australia that are having an impact on farming and biodiversity. Priority research themes include reducing the rate of emergence of new weed problems, reducing the impact of existing weed problems of national priority, and supporting national frameworks and capacity for sustainable weed management.

3. Links to Land & Water Australia's Strategic R&D Plan (2005-2010)

Land & Water Australia commenced a new Strategic R&D Plan (2005-2010) on 1 July 2005. In developing the Strategic Plan, a comprehensive environmental scan was conducted. Specific R&D activities and outputs planned for 2006-07, as well as longer term planned outcomes, are described in section 6.

The management of Australia's rich and unique endowment of natural resources has never been higher on the national agenda. Water resources – both surface water and groundwater – are under extreme pressure, as the majority of the Australian population experiences water restrictions and irrigators face severely reduced allocations. Australia has long had to deal with extreme climate variability, but there is now evidence that each drought is hotter than the last, and we seem to be in a more profound drying cycle, especially in south-western and south-eastern Australia.

Australia is one of the most biologically diverse countries on the planet, and most of our native species exist in no other country, which means that responsibility for their management and future prospects rests with us. The management of vegetation, both pastures and trees, is critical in achieving an appropriate hydrological balance, in managing carbon emissions, in minimising further losses of biodiversity and in sustaining many of our grazing systems. Invasive introduced species, both plants and animals, continue to impose significant costs on agricultural production, and fierce competition and predation pressures on native species.

Australian soils are the engine room of agricultural productivity. Soil management remains an important development opportunity for more sustainable production systems.

The uniqueness of Australia's landscapes, climates, soils and biota means that in the main we cannot import knowledge about management of our natural resources. We have to develop our own solutions for our own problems. Our agricultural production systems have to be smarter and more sophisticated to achieve comparable levels of profitability with our international competitors who enjoy younger, richer, more forgiving soils with more reliable climates. Demographic change, especially along the eastern seaboard, will intensify competition for rural land and place pressure on the resource base, while opening up new opportunities through the influx of new capital and a wider range of people.

In response to the challenge of balancing the often competing demands on rural landscapes, governments across Australia, led by the Australian Government, have fostered new organisations at catchment and regional scales. These new catchment bodies and regional committees are charged with important planning responsibilities, and often with the demanding task of prioritising and allocating public funding through large national funding programmes such as the National Landcare Programme, Natural Heritage Trust (NHT), and the National Action Plan for Salinity and Water Quality (NAP). These organisations are becoming important players in the natural resource management knowledge system, and critical clients for NRM research outputs.

Against this background, there is a greater need than ever for carefully targeted and well-managed research: to generate the uniquely Australian knowledge needed to improve Australian farming systems and consequent profitability; to manage our natural resources more sustainably; to inform large public investments in natural capital; and to help governments balance competing demands on natural resources and rural landscapes.

Strategic Directions

The Corporation is required under the PIERD Act to prepare a Strategic R&D Plan every five years. The Strategic Plan for the 2005-2010 period has the following key elements:

Vision: Land & Water Australia's vision is:

"The sustainable use and management of natural resources for the benefit of primary industries and the Australian community"

Outcome: The overall outcome we are working towards, in line with the Australian Government Department of Agriculture Fisheries and Forestry and other key stakeholders, is:

"Knowledge, understanding and informed debate to inspire innovation and action in sustainable natural resource management."

Mission: Land & Water Australia's mission, directed to achieving the above outcome, is:

"To invest in knowledge, partnerships, innovation and adoption to underpin sustainable natural resource management."

Strategy 1: Research Investment

Investing in R&D for sustainable natural resource management remains our core business and our highest priority. Our R&D management processes are focused on: the identification of national priorities; selection of topics where we can add most value; development of the most effective interventions; design and implementation of the research and adoption process; and evaluation of the results. Strategy 1 is delivered through four R&D arenas:

Industries Arena
The Industries Arena supports primary producers in generating economic, environmental and social benefits. It involves mainly biophysical, economic and increasingly social research through a range of industry partnerships, jointly with other R&D corporations. A key focus is research that bridges the critical gap between farming practices at paddock and farm scale, and catchment-scale plans and targets for outcomes such as water quality and biodiversity.

Landscapes Arena
The Landscapes Arena targets primary producers, catchment and regional bodies, advisors and governments. It focuses strongly on understanding ecological functions and processes at the farm-to-landscape scale, and the technical and socio-economic challenges of the regional model of natural resource management. Partnerships are sought to increase the scale and impact of the Arena but Land & Water Australia-determined priorities are the primary focus.

People Arena
The People Arena targets the full gamut of NRM stakeholders in both policy and implementation roles, and operates at multiple scales. The research targets the social, economic and institutional issues that are often at the heart of natural resource management problems and central to their solution. It encompasses a range of social sciences and economics, integrated with biophysical research in the other Arenas where feasible and appropriate. Partnerships are sought to increase scale, impact and adoption, particularly at the project level.

Innovation Arena
The three Arenas above are based primarily around commissioned research on priorities identified by Land & Water Australia and its funding partners. To complement this commissioned research, and recognising the need to allow space for more novel ideas and researchers' own suggestions, Land & Water Australia reserves a portion of its research portfolio for high innovation proposals emerging from the scientific community, that don't necessarily overlap with the priorities of other programmes. The Innovation Arena also has a key focus on building research capacity in natural resource management through targeted and highly competitive scholarships and fellowships.

Strategy 2: Collaboration and Strategic Analysis

Land & Water Australia's collaborations bring together researchers and stakeholders from across Australia to reach consensus on R&D priorities, desired outcomes, and to facilitate adoption. We seek to collaborate with rural industries, other funding bodies, government agencies and community-based groups to broker partnerships for R&D programmes and to build capacity within the research community to work with industry, rural communities and government. These partnerships influence research directions, minimise duplication, maximise research investment on key priorities and provide a great platform for increasing adoption.

Land & Water Australia is also developing a more active role in promoting, integrating and reporting NRM research across the rural R&D corporations. In this plan, we will further develop this capacity and report to government and the wider community (working in partnership with the National Land and Water Resources Audit where appropriate) on: priority NRM issues in Australia; current and planned NRM R&D activities in Australia; assessments of Australia's research capacity across all NRM fields; emerging issues likely to be of high future significance; cost-benefit analyses on potential interventions; and current funding levels and future needs for NRM R&D.

Strategy 3: Knowledge into Practice

We will continue to increase our efforts to improve the adoption of existing and new knowledge by farmers, rural industries, catchment managers and policy makers. In the Knowledge and Adoption team we will test a number of adoption pathways for our research outcomes across sectors, working with farming groups, agri-business consultants, NGO networks and government facilitators. We will continue working in partnership with the Department of Agriculture, Fisheries and Forestry on a significant project in regional knowledge exchange that targets catchment management organisations. At policy levels, we try to close the gap between research activities and policy formulation so that research is working more closely with policy in an adaptive management sense. In our Industries Arena we work in partnership with other RDCs and farm advisors targeting key farmers and rural communities.

In 2006-07, Land & Water Australia will be working to improve adoption by developing knowledge and adoption strategies for new programmes, better managing the legacy of completed programmes and developing synthesis products that provide useful information for targeted groups such as regional organisations, policy makers and land managers. We will continue to work with the regional organisations to improve the two way exchange of information between them and national knowledge providers. The establishment of a new content management system and intranet will enable us to manage our knowledge more effectively and will create opportunities to link and synthesise research outcomes.

Return On Investment
Land & Water Australia continuously evaluates its R&D investments to measure accurately and robustly its Return On Investment in economic, environmental and social terms. In 2006-07, we will complete the evaluation of over 30 percent (covering more than 300 projects) of our R&D investment since inception in 1990, using an internally-developed methodology which leads the field in Australasia.

4. Income & Expenditure in 2006-07

Land & Water Australia expects to receive $12.751m from Commonwealth appropriations in the 2006-07 financial year. It is estimated that third party contributions and other income will be around $19.111m in 2006-07, although further revenue from third parties is likely to be sourced during the year.

The Corporation's emphasis on R&D activities is demonstrated by around 83 percent of total expenditure being directed in this area during 2006-07. Forecast expenditure is detailed in the following income and expenditure budget and graph. The Corporation has included all the expenditure items as required under Section 33 of the *PIERD Act 1989*.

Table 2. Land & Water Australia 2006-07 Budget

Revenues		**$,000s**	**%**
Revenue from Government		12,751	40%
Third party contributions (1)		18,611	58%
Interest & Other income		500	2%
Total Revenue		**31,862**	**100%**
Expenses			
Strategy 1: R&D Investment	Industries	12,310	38%
	Landscapes	7,321	23%
	People	1,602	5%
	Innovation	1,509	5%
	Sub-TOTAL	**22,742**	**71%**
Strategy 2: Collaboration & Strategic Analysis		445	1%
	National Land & Water Resources Audit	3,550	11%
	Sub-TOTAL	**3,995**	**12%**
Strategy 3: Knowledge into Practice		**2,501**	**8%**
Corporate Enabling Functions		**2,924**	**9%**
Total Expenses		**32,162**	**100%**
Net Surplus (Deficit)		**(300)**	
Accumulated surplus at beginning of reporting period		**1,766**	
Total Accumulated Results		**1,466**	
CAPITAL BUDGET (2)		**120**	

NOTES:

1 Does not include other funds that may be derived from new partnerships established during the year.

2 In 2006-07, the Corporation has a capital expenditure budget of $120k funded from internal reserves. The related depreciation expense has been included in Corporate expenditure.

3 The Corporation will be providing $83,000 in funding to its Representative Organisations in 2006-07 – specifically for a research project undertaken by Dr Rosemary Hill of the Australian Conservation Foundation (ACF) titled: Investigation of a Conservation Economy Model for Indigenous Northern Australia.

The pie charts below depict the planned distribution of expenditure for the Corporation in 2006-07 across the three key strategies in the Strategic R&D Plan 2005-10 (Figure 1), and across the four R&D Arenas within Strategy 1 (Research and Development) in the Strategic R&D Plan (Figure 2). The left hand chart in each case depicts total expenditure (Land & Water Australia funds and partner funds) and the right hand chart depicts Land & Water Australia funds only.

Figure 1. Planned Expenditure across Strategies 2006-07, Land & Water Australia funds and Total funds

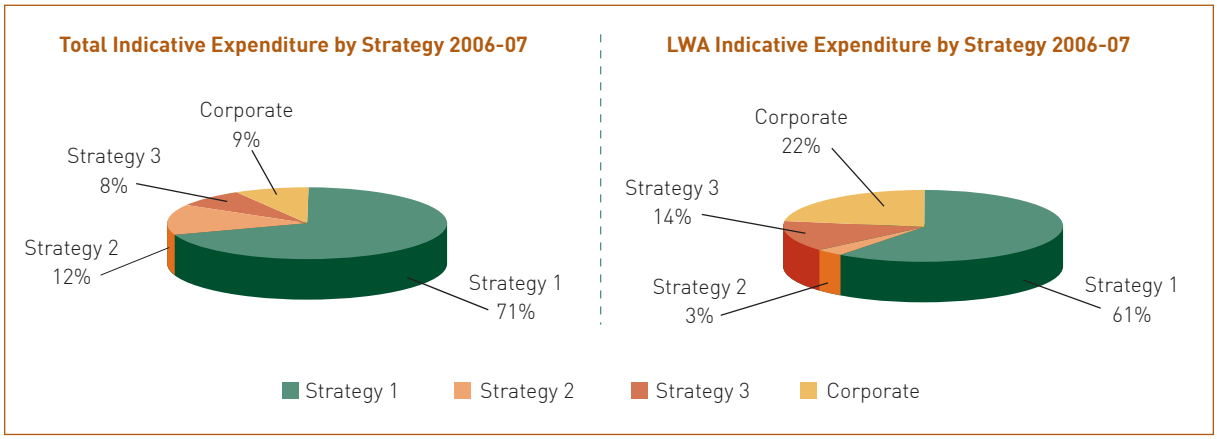
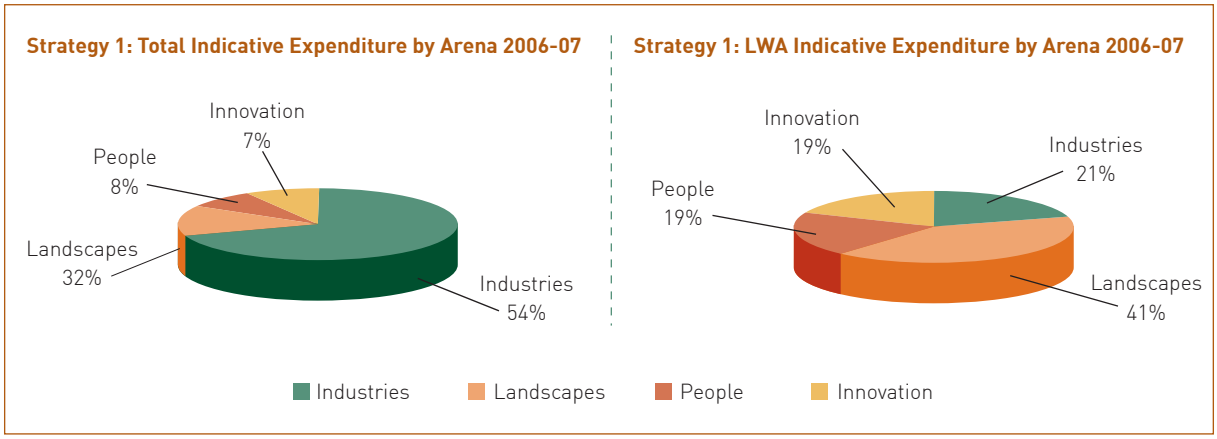


Figure 2. Planned Expenditure across R&D arenas within Strategy 1 2006-07, Land & Water Australia funds and Total funds



Several key points about Land & Water Australia's business model can be gleaned from the budget table in Table 2, and the pie charts in Figures 1 and 2 on the previous page:

1. In 2006-07, revenue from partners significantly exceeds that from the core Australian Government appropriation. Experience in recent years suggests that additional partner revenue is likely to be sourced during the 2006-07 year, so the final revenue split for the year could be higher than the 60:40 partner to Australian Government appropriation/other income split currently committed.

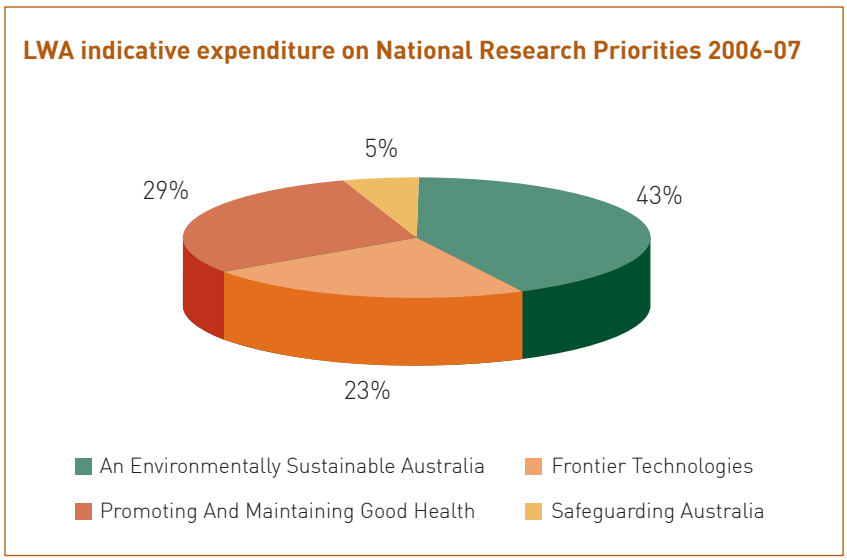
2. Figure 1 shows that partner funds are invested primarily in R&D (Strategy 1), and to a lesser extent Collaboration and Strategic Analysis (Strategy 2 – mainly the National Land & Water Resources Audit). Land & Water Australia investments in Knowledge and Adoption (Strategy 3) and corporate enabling functions underpin the collaborative business model that is so attractive to investing partners.

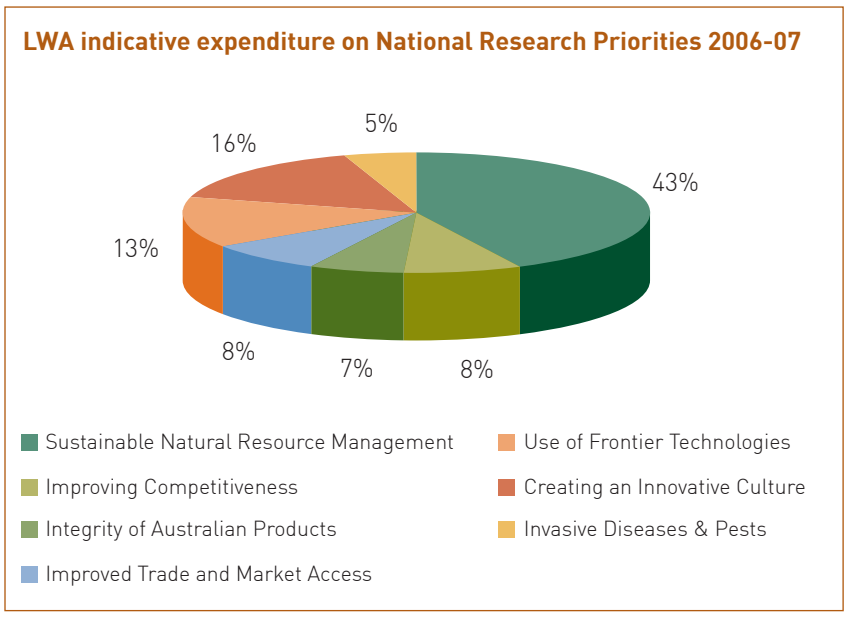
3. Figure 2 shows that the bulk of partner R&D investment is through the Industries Arena, which accounts for 54 percent of total R&D expenditure but only 21 percent of Land & Water Australia expenditure on R&D. Landscapes accounts for 41 percent of Land & Water Australia expenditure, and the other Arenas share the remaining Land & Water Australia R&D funds relatively evenly.

Land & Water Australia manages approximately one third of the expenditure on natural resource management R&D by all the Rural Research and Development Corporations (RDCs). The RDCs invested a total of $78.5m on natural resource management R&D in 2004-05 out of a total expenditure of $510m. Most of the expenditure was focussed on environmental sustainability and frontier technologies for transforming Australian industries.

In 2006-07 Land & Water Australia's investments can be mapped against the National and Rural Research priorities as shown in Figure 3. The highest proportion of funds (43 percent) are allocated to the National Research priority "An environmentally sustainable Australia" and the Rural Research Priority "Sustainable Natural Resource Management". Significant funds are also allocated to the National Research Priorities "Frontier technologies for building and transforming Australian industries" (29 percent) and Promoting and maintaining good health – strengthening Australia's social and economic fabric" (23 percent).

Figure 3. LWA indicative expenditure on the National and Rural Research Priorities in 2006-07





5. Corporate Governance and Accountability

Land & Water Australia is committed to the highest standards of corporate governance in meeting or exceeding the requirements of the Commonwealth Authorities and Companies Act (1997). Processes adopted by Land & Water Australia include: annual internal and external (independent) audits of all financial and accountability operations; a Board Charter and code of conduct for directors including a due-diligence checklist completed at each Board meeting; external evaluations of Board performance; an independent external member of the Audit Committee; detailed governance and best practice guidelines for programme management committees (including procedures for the disclosure and management of conflict of interest); and an organisation-wide risk identification and management framework.

Land & Water Australia's key strategies are underpinned by a strong commitment to corporate governance and accountability, which in turn depend on sound corporate enabling functions. As the Corporation has grown in recent years and entered into many more partnerships with a wider range of collaborators, the demands on our corporate enabling functions have increased. A major overhaul of the key corporate enabling functions (Finance, Governance, Procurement, Human Resources, IT and Information Systems) undertaken through 2005-6 via Project ReWire, has established a much more solid platform for the future growth of the Corporation. Project ReWire has delivered quantum improvements in performance, risk management and efficiency through better and more cohesive corporate enabling functions.

During 2006-07, these improvements will be consolidated and integrated into standard operating procedures across the Corporation. The mitigation of inherent risks will continue to be a major focus for the organisation. To assist in risk mitigation practices, a revised governance framework cascading from Board Policies through Executive Director Instructions to procedures, guidelines and templates is being developed and will be made available to staff and Board members via a new intranet.

The Corporation is currently party to a cluster procurement process for a new Project Management Information System (PMIS) in a consortium with the National Water Commission, and the Rural Industries and Cotton R&D Corporations. The new system will be implemented over 2006-07 to deliver considerably more functionality, efficiency and improved compliance in terms of reporting. Further improvements to the Corporation's enabling systems can be expected over 2006-07 to better support the outcomes described in the 2005-10 Strategic R&D Plan.

Finance and risk management

Land & Water Australia will continue to provide internal and external stakeholders with timely and accurate financial information. An improved interface between the Corporation's accounting package and the Programme Management Information System will deliver more timely programme budgets and updated expenditure forecasts as R&D projects evolve. New revenue recognition policies, and more proactive management of interest revenue, will ensure that reserves remain within the band agreed by the Board.

Land & Water Australia will continue to use its risk management plan as a key management tool in achieving outcomes of the 2005-10 Strategic R&D Plan. The Finance Committee and the Audit Committee (sub-committees of the Land & Water Australia Board) will oversee the review of financial management, and the review of the Risk Management and Fraud Control plans, consistent with their respective roles in providing strategic and policy guidance to the Corporation.

Human Resource Management

Land & Water Australia through Project ReWire has developed a new Human Resources Plan, which aims to ensure that Land & Water Australia remains a competitive employer in the Canberra market, able to attract,

retain and support people with the necessary skills, experience, networks and commitment to meet our goals. That plan sets out activities and initiatives in areas such as staff training and induction, performance management, work-life balance and recruitment.

Knowledge and Information Systems

Land & Water Australia is in the knowledge business. We invest in knowledge, we manage knowledge assets, and we try to facilitate the uptake of R&D outputs to get knowledge adopted into practice. We also undertake strategic analyses for our own internal purposes, and for wider target audiences through Strategy 2. It is important that Land & Water Australia is able to describe, tap into, analyse, synthesise, disseminate and make accessible its whole portfolio of R&D outputs generated since 1990, and that this portfolio of knowledge assets is continuously updated with the progress of every single R&D project and synthesis activity. This is not a trivial challenge, but developments in IT systems and the world wide web have opened up new possibilities for managing data, information and knowledge more effectively and efficiently.

During 2006-07, Land & Water Australia will make full use of its new web content management system by delivering information to stakeholders in a more timely and user-friendly manner. The organisation is poised to implement a new Programme Management Information System - providing improved functionality and integration with existing and proposed applications.

6. Planned Activities, Outputs, Outcomes & Performance Measures for 2006-07

Planned Outcome for 2006-07

The overall planned outcome from Land & Water Australia's 2005-2010 Strategic Plan is given below, and detailed activities and outputs are presented against each strategy overleaf. Each year, progress towards this longer term outcome is evaluated and updated through a triple bottom line benefit-cost analysis based on case studies of the Corporation's most significant innovations. Analyses to date cover 25 percent of the Corporation's R&D investment since 1990. This will be increased to 30 percent in 2006-07.

Planned Outcome	Performance Indicator	2006-07 Performance measurement
Knowledge, understanding and informed debate to inspire innovation and action in sustainable natural resource management	Improvements in the understanding, management and condition of Australia's natural resources that can be linked demonstrably with the adoption of the outputs of our research investments.	Triple bottom line benefit cost analysis of 28 major Land & Water Australia innovations covering approximately 30% of Land & Water Australia's R&D investment since 1990. Both qualitative and quantitative measures of benefits of R&D and their impacts on the condition of Australia's natural resources are undertaken.

Strategy 1 - Research investment

Performance indicator: Generation of new knowledge useful to the sustainable management and use of Australia's natural resources.

Performance measure: Audit of knowledge assets and technologies produced and disseminated and predictions of their utility.

Note: The figures below refer to cash only. Actual investment at the level of R&D projects is higher again, when project level cash and in-kind contributions from research providers is considered.

Land & Water Australia in-kind inputs to collaborative R&D programmes are considerable, even where the cash contribution is zero, through provision of corporate services and the expertise of Land & Water Australia staff.

Planned Activities for 2006-07	National Research Priorities --- Rural Research Priorities	Inputs ($)	Major Planned Outputs for 2006-07	Planned Outcomes for 2005-2010
Land, Water and Wool (LWW) Ensuring eastern states regional NRM bodies in woolgrowing areas understand LWW research relevant to their Regional Catchment Strategy through a targeted extension activity. Finalisation of individual LWW projects. Handover of LWW research and products to AWI.	**1*** --- **A, B, C,D*** **(*see code in table 1)**	Land & Water Australia $0 Partners $2.983m	Land Water & Wool final reports: (1) incorporating management practices that combine improved productivity with better natural resource management especially for saline lands, native vegetation, riparian areas and pastoral country. The information will be structured according to production zones (high rainfall, wheat-sheep and pastoral); (2) report to Australian Wool Innovation including key findings, products, implications for policy, evaluation results and future R&D needs.	Outcomes by Dec 2006 More than 2000 wool producers applying natural resource management innovations. A conservatively estimated $58m in improved productivity for wool producers and $46m in enhanced environmental benefits. Improved industry NRM awareness, priorities and practices, market access and community support. A better understanding in Regional NRM bodies of how woolgrowers can contribute to regional NRM targets while improving productivity.

Grain & Graze Continue research, development and extension projects in nine regions. Establish national research projects covering economic and social analysis and biodiversity. Hold national and regional forums which bring together Grain & Graze stakeholders. Initiate planning and consultation among investment partners about the future of Grain & Graze. Continue communications activities.	**1** **----------** **A, B, C, D**	Land & Water Australia $0.600m Partners $3.257m	Economic analyses completed on the profitability of current mixed farming options across 5 regions. Commencement of analyses of emerging mixed farming systems across 5 regions. Social analyses completed of drivers and impediments of change-on-farm across nine regions, with the analyses used as the basis for extension of Grain & Graze research results. New insights into emerging mixed farming systems appropriate to local conditions documented for nine regions. Biodiversity measurements commenced on 40 mixed farms across 8 regions, with preliminary analysis completed on the status of biodiversity under different vegetation regimes, including cropping, short and long term pasture rotations and remnant vegetation.	Outcomes by June 2008 A 10% increase in mixed farm productivity driven by a 5% increase in grain yields and a 10% increase in livestock production. Improved condition of natural resources on mixed farms, in line with regional or catchment targets. More confident and knowledgeable mixed farmers.

National Programme for Sustainable Irrigation Complete research projects and their review. Develop synthesis products promoting outputs. Communications activities which raise awareness about sustainable irrigation. Complete Programme evaluation. Complete scoping and development of new programme phase. Negotiate investment of new funds by current partners in new phase. Broker new investment from new partners. Establish strategic alliances with relevant players in water and irrigation – such as National Water Commission.	**1** **----------** **A, B, C, D**	Land & Water Australia $0.330m Partners $0.892m	Framework established to enable irrigation to be developed and managed in a sustainable manner across northern Australia. LongStop wetting front detector field tested. Salinity relationships for irrigated horticulture along the Lower Murray: Riverland, Sunraysia and NSW determined. Simulation completed of the performance of vines under different scenarios of River Murray salinity at Morgan. Method for quantifying real time root zone drainage and salinity developed for growers. Knowledge Base on sustainable irrigation updated. Synthesis publication and web version capturing results of Programme Phase 1. Programme Final Evaluation Report.	Outcome by 2007 Substantial improvement in the environmental and productive performance of irrigated agriculture in Australia.

Managing Climate Variability Complete research projects and their review. Develop synthesis products promoting outputs. Communications activities which raise awareness about the value of seasonal climate forecasting. Complete Programme evaluation. Undertake scoping and development of new phase of climate programme. Negotiate investment of new funds by current partners in new phase. Broker new investment from new partners. Establish strategic alliances with other climate research investors and providers.	**1** **----------** **A**	Land & Water Australia $0.376m Partners $1.603m	AussieGRASS and seasonal climate forecasts linked to predict regional trends. PaddockGRASP for NRM at property scale. Learning package for dairy farmers on feed management in association with Seasonal Climate Forecasts. WhopperCropper database incorporating APSIM simulations relevant to districts in NSW, Vic, SA and WA. Grain farmer responses to climate information in SE Australia collated. Seasonal forecast system for SE Australia tailored for specific management decisions and potential forecast skill. Priority issues that could be better managed in catchments with use of climate information. Key climate change adaptation strategies for catchment-scale NRM issues. Fine-grained analysis of how climate has been changing in three key regions. Verified potential evaporation (PET) data for Australia. Overview of use of weather derivatives in world-wide agriculture and survey of local buyers and sellers needs. SOI-based derivatives to manage climate variability on representative wheat farms. Synthesis publication and web version capturing results of current Programme Phase.	Outcomes by June 2007 Land managers increasing profitability and sustainability by using climate variability information and products in applications in agriculture, fisheries, forestry and natural resources.

Healthy Soils Programme Establish applied research and demonstration sites nationwide. Complete contracting of new projects. Hold National Forum. Develop a "living" Knowledge Base. Develop Communications Strategy and undertake activities which raise awareness about healthy soils. Develop monitoring and evaluation framework.	**1** **----------** **A,B,C,D**	Land & Water Australia $0m Partners $1.879m	Research and demonstration sites in place, with field days held and attended by farmers. Workshops held and training materials developed for farmers on healthy soils. Proceedings released from National Forum. Framework for Knowledge Base in place. First report released which draws together existing knowledge in healthy soils.	Outcomes by June 2008 More farmers moving to "practices which maintain and restore our soils" which in turn contributes to healthy catchments and sustainable agricultural enterprises. Replenishment of Australia's expertise in soils.
Environmental Water Allocation Manage contracted research projects. Scope and commission new research projects on groundwater. Develop and implement Knowledge and Adoption Plan. Seek additional Programme Partners. Develop new research needs in estuaries and river flow management.	**1** **----------** **A**	Land & Water Australia $0.720m Partners $0.351m	New research projects underway to deliver: • Demonstrated benefits of environmental water allocation • Methods for monitoring and evaluating environmental water allocation • New mechanisms for managing groundwater dependent ecosystems • Assessments of water needs of aquatic ecosystems across Australia • Collaboration between researchers and managers in designing environmental allocations • Assessments of innovative institutional approaches to water allocations. A report on the research needs for estuarine freshwater flows	Outcomes by 2010 Improved methods for monitoring and evaluating environmental water allocation. More effective engagement of researchers with managers in designing environmental allocations. Improved ability for policy-makers, planners and managers, particularly regional groups, to make decisions on water allocation. Improved understanding of water needs of aquatic ecosystems across Australia. Improved understanding of the opportunities and threats to water availability.

Tropical Rivers Manage contracted research projects Scope and commission new research projects Develop and implement Knowledge and Adoption Plan Seek additional Programme Partners Develop knowledge and adoption plan Disseminate outputs from completed projects	**1** **----------** **A**	Land & Water Australia $0.720m Partners $0.359m	New research projects underway that support the sustainable use, protection and management of Australia's Tropical Rivers and in particular to deliver: • Methods for valuing and managing the ecosystem services of tropical rivers • Trial methods for undertaking total water resource assessment in Tropical Australia • Institutional arrangements for Indigenous participation in the NWI • A remote sensing approach to map and classify riparian gully erosion in Tropical Australia New partner links established across Commonwealth, State and Territory agencies. Knowledge and adoption strategies developed. Knowledge assets from fish research projects published.	Outcomes by 2010 Improved ability for policy-makers, planners and managers, particularly regional groups, to make decisions about use of and impacts on tropical rivers Improved knowledge for determining management priorities and evaluating land use practices in tropical Australia Improved understanding of risks and threatening processes in order to develop effective responses.

Native Vegetation and Biodiversity programme Manage contracted projects and commission new research projects Develop and implement Knowledge and Adoption Plan Seek additional Programme Partners Promote activities in the arid and semi-arid regions; the tropical savannahs, and the drier margins of the wheat-sheep belt Implement outcomes of Vegetation Futures Conference 2006	**1** **----------** **A**	Land & Water Australia $0.870m Partners $0.663m	New research projects underway that support the sustainable use, protection and management of Australia's native vegetation and biodiversity including to deliver:- • Quantified benefits of native vegetation for pest control in cotton and grain crops • GIS tools to assist land managers predict the outcome for fire management tools in the Murray-Mallee region • Landscape design principles for maintaining ecosystems services in tropical agricultural landscapes • Methods to improve the success of revegetation in productive landscapes • Improved education and extension tools New partner links established across Commonwealth, State and Territory agencies, and industry and non-government groups involved in native vegetation management. National R&D capacity in native vegetation, ecosystem services and biodiversity management	Outcomes by 2010 Improved understanding and valuing of landscape processes, including the role and function of biodiversity in delivering ecosystem services. Improved understanding of risks and threatening processes in order to develop effective responses Improved ability for policy-makers, planners and managers, particularly regional groups, to make decisions on use and impacts on native vegetation.
Native Vegetation Programme Finalise contracted research projects and Knowledge and Adoption activities	**1** **----------** **A**	Land & Water Australia $0.199m Partners $0.010m	Synthesised outputs from the concluding Native Vegetation R&D Programme (1999-2005) disseminated.	Improved ability for policy-makers, planners and managers, particularly regional groups, to make decisions using, and impacting on, native vegetation by 2007.

National Weeds R&D Programme Scope and commission new research projects Develop and implement Knowledge and Adoption Plan in conjunction with the broader 'Defeating the Weed Menace' programme Develop programme research directions in conjunction with National Weeds Advisory Group	**1** **----------** **F**	Land & Water Australia $0m Partners $2.550m	Commissioning of research projects to generate new knowledge to prevent the development of new weed problems, to reduce the impacts of weeds of national priority, and to build capacity for their management in the future including:- • Assessments of the risks of different sources and pathways of weed ingress into and within Australia under changing trade patterns and environmental conditions • Analysis of the impacts of productive land use change and peri-urban development on weed incursion within Australia • Collaboration with industries to develop approaches to help weed source sectors reduce their risk • Identification of new biological control agents for agreed national priority weeds in a landscape context	Outcomes by 2009 A lowered rate of emergence of new weed problems A reduced impact of existing weed problems of national priority Increased national capacity to manage weeds Improved decision-making on resource allocations to manage
Joint Venture Agroforestry Programme (managed by RIRDC) • Manage research agreement with RIRDC • Implement Knowledge and Adoption activities	**1** **----------** **A, B,C,D**	Land & Water Australia $0.450m Partners $0m	New projects contracted and underway to deliver: • Improved methods for direct seeding (improved survival and establishment, reduced cost, and improved communication of existing regional expertise in direct seeding techniques) • Trial markets for ecosystem services for farm forestry plantings Guidelines for improved design and management of plantations for biodiversity and ground water table outcomes. Knowledge and adoption plan implemented for completed projects.	Outcomes by 2009 New products and improved agroforestry systems using woody perennials, which augment farm income whilst maintaining biodiversity and sustainably managing natural resources Wider consideration of the potential for broadscale planting of woody perennials in low to medium rainfall zones to meet environmental and economic objectives, in particular dryland salinity A greater awareness of the potential of environmental services markets for agroforestry Better understanding of agroforestry product supply and marketing.

Social and institutional research Manage existing portfolio of projects. Coordinate and develop the internal Land & Water Australia indigenous research portfolio. Manage and review investment in Cooperative Venture on Capacity Building (CVCB) jointly with partner RDCs. Promote progressive outcomes from new 4 year longitudinal project working with 10 regional NRM groups to improve learning capacity to make investments that promote effective practice change. Negotiate and manage further project partnership arrangements and external programme management. Develop and conduct second Programme Call/ commissioned projects for remaining Programme period 2007-10.	**1, 2** --- **A, F**	Land & Water Australia $1.252m Partners $0.070m	New projects underway resulting from first Programme Call, including projects integrated with other Land & Water Australia Programmes. Research reports on: • Integrated cultural and natural resources plans for pastoral properties in the East Kimberley • Tools for applying the visual and performing arts to shape environmental behaviour. • Development of indigenous knowledge capacity across north Australia. • Extension of rural local government environmental capacity by improving access to national data. • Assessment of social and economic values of Australia's tropical rivers. • Improved NRM programme and project design, implementation and evaluation. • Identification of institutional changes enabling kangaroo harvest to promote sustainable rangeland landscapes. • Assessment of impacts and learning from large scale collaborative R&D initiatives. • Understanding of the nexus between indigenous health and sustainable northern landscapes • Elaboration of implications of change and continuity in peri urban Australia through scenarios and strategies for sustainability • A national conference "Social sciences and national water reform".	Outcomes by 2010 Improved effectiveness of and increased options for institutional arrangements for NRM, including for regional groups and national water reform. Understanding the methods and costs and benefits of institutional arrangements and capacity for integrated NRM. Development of strategies and policy instrument choice and mix, especially market based instruments, to increase adoption of affordable, sustainable NRM options, systems and practices. Increased capacity of policy-makers and resource managers to anticipate the future scenarios and impacts of changing policy and management approaches and to design effective transition arrangements. Strategies to support and improve engagement and interactions between indigenous people and government, NRM agencies and researchers. Greater understanding of the levers, drivers and constraints linking lifestyles, livelihoods and landscapes to achieving change for sustainable NRM, including in peri-urban areas.

Innovation Conduct a national call for high innovation projects. Conduct a national call for scholarships. Select two new Land & Water Australia Senior Research Fellows.	**1, 3** --- **A, F**	Land & Water Australia $1.509m	A group of highly innovative projects selected and funded from a competitive national call. At least four PhD scholarships funded in critical NRM areas. Research results on: • Policy integration for sustainable NRM. • Tax effective instruments for improving private sector conservation. • Incorporating equity into environmental policy. • Transition to a biofuel economy. • Transport of groundwater contaminants in heterogeneous aquifers. • Molecular environmental diagnostics for sustainable land management. Postgraduate scholarship theses. Travelling and Visiting Fellowships reports. Outputs from the three inaugural Senior Research Fellowships widely promoted: • Stream-Aquifer Interaction in Australia (Dr Rick Evans) • ReThinking Rural Australia (Dr Neil Barr) • Drought and Freshwater Ecosystems (Prof Sam Lake)	Outcomes by 2010 Significant breakthroughs achieved in novel approaches and technologies for sustainable natural resource management. Australian research capacity built in areas of critical gaps. Seminal syntheses by leading researchers influence NRM policy and practice.

Strategy 2- Collaboration & Strategic Analysis

Performance indicator: Number and financial leverage of programme and project partnerships.
Increased research capacity in critical areas.
Quality of analysis of strategic issues in NRM.

Performance measure: Financial leverage of collaborative programmes.
Change in the distribution and quality of the NRM research base.
Government feedback on the quality and utility of Land & Water Australia reports on NRM research issues.

Planned Activities for 2006-07	National & Rural Research Priorities	Inputs ($)	Major Planned Outputs for 2006-07	Planned Outcomes for 2005-2010
Partnership negotiations for both new and ongoing programmes. Analyses of national NRM issues and trends, research activity and research capacity.	**1, 2, 3, 4** --- **A, B, C, D, E, F, G**	Land & Water Australia $0.250m	Partnerships for new Land & Water Australia initiatives established. Global and Australian NRM Trends Reports 2007. Strategic Knowledge Framework completed. First analysis of NRM R&D activity in Australia by priority issue and region. Methods for assessing science/research capacity developed and tested.	Greater efficiencies in research investment, reduced duplication of effort, and effective application of Australia's NRM research capability against national priorities. Australian NRM R&D investors and policy makers well informed on national research priorities, activities and capacity.
Coordination of the Research & Development Corporations Natural Resource Management Group.	**1, 3, 4** --- **A, B, C, E, F, G***	Land & Water Australia $0m Others $0.040m	New report developed on RDCs investment in NRM for the 2006-07 financial year.	Greater consistency and collaboration among RDCs on investment in natural resource management.

Strategy 2- Collaboration & Strategic Analysis

National Land and Water Resources Audit

Performance measure: Delivery of corporate administrative and contract management services as per the Service Level Agreement to the NLWRA signed with the Department of Agriculture Fisheries and Forestry.

Planned Activities for 2006-07	National & Rural Research Priorities	Inputs ($)	Major Planned Outputs for 2006-07	Planned Outcomes for 2005-2010
Land & Water Australia will work to support the achievement of the Audit's Annual Operational Plan, developed by the Audit Management Unit and endorsed by Audit Advisory Council and the Natural Heritage Ministerial Board.	1 ---------- A	Land & Water Australia $0 NHT $3.550m	Accommodation and corporate support to levels set out in the annual service level agreement between Land & Water Australia and DAFF.	Agreed national data protocols and standards, and tools and methodologies to: underpin nationwide assessments of Australia's land, water and biological resources; and to support monitoring and evaluation of natural resource management policies and programmes to support sustainable development.

Strategy 3- Knowledge into practice

Performance indicator: Rates of adoption of Land & Water Australia R&D outputs and products over the next 5 years.

Performance measure: Adoption profiles of LWA programme and portfolio outputs and products including e-nalysis and publications.

Planned Activities for 2006-07	Research Priorities	Inputs ($)	Major Planned Outputs for 2006-07	Planned Outcomes for 2005-2010
Embed managing for adoption of R&D into all stages of programme and project lifecycles. Encourage sharing of and investment in intellectual capital for adoption across R&D organisations. Increase the relevance and adoptability of our applied research. Capitalise on and value-add to our knowledge base. Develop best available organisational systems to underpin knowledge management and adoption. Encourage high level and continuous improvement of LWA people and partners' capacity to contribute to the adoption of R&D. Improve access to, and distribution of, LWA information and products.	**1, 2, 3, 4*** --- **A, B, C, D, E, F, G*** **(*see code in table 1)**	LWA $1.801m NHT $0.700m	Knowledge and Adoption strategies developed for new programmes. Legacy products/processes developed for completed programmes. Knowledge and Adoption toolkit finalised and rolled out with training workshops. Synthesis products developed with successful models for developing them. New content management system with a corporate intranet established and update of programme websites. Increased interactive capacity of corporate website. Mechanisms established for two way information exchange between regional bodies and national R&D providers. Corporate and programme level events, publications and materials.	Significant improvements in the adoptability and adoption of LWA-funded R&D outputs. Managing for adoption of R&D embedded into all stages of programme and project lifecycles with best practice monitoring and evaluation processes in place. Productive partnerships with Industries to enable adoption of NRM R&D. Efficient pathways for adoption established in the regional framework for NRM delivery. Continuous improvement of LWA people and partners' capacity to contribute to the adoption of R&D. Continuously improved access to, and distribution of, LWA information and products.

APPENDIX 1: LWA Indicative Expenditure by Programme on the National and Rural Research Priorities (2006-07)

National Research Priorities (NRP)	*An Environmentally Sustainable Australia*		*Promoting and Maintaining Good Health (strengthening Australia's social & economic fabric)*						*Frontier Technologies for Building and Transforming Australian Industries*				*Safeguarding Australia*	
Rural Research & Development Priorities (RRDP)	**Sustainable Natural Resource Management**		**Improving Competitiveness through a Whole of Industry Approach**		**Maintaining & Improving Confidence in the Integrity of Australian Agricultural, Food, Fish and Forestry Products**		**Improved Trade and Market Access**		**Use of Frontier Technologies**		**Creating an Innovative Culture**		**Protecting Australia from Invasive Diseases and Pests**	
	$	%	$	%	$	%	$	%	$	%	$	%	$	%
Industries Arena	3,200,600	26	1,723,400	14	1,723,400	14	1,477,200	12	2,215,800	18	1,969,600	16	0	0
Landscapes Arena	5,124,700	70	366,050	5	0	0	366,050	5	146,420	2	146,420	2	1,171,360	16
People Arena	1,281,600	80	0	0	0	0	160,200	10	0	0	160,200	10	0	0
Innovation Arena	0	0	0	0	0	0	0	0	603,600	40	905,400	60	0	0
Strategy 2	1,757,800	44	199,750	5	119,850	3	279,650	7	599,250	15	878,900	22	159,800	4
Strategy 3	1,100,440	44	125,050	5	75,030	3	175,070	7	375,150	15	550,220	22	100,040	4