



**Australian Government**  
**Productivity Commission**

# Rural Research and Development Corporations

## Productivity Commission Draft Report

September 2010

This is a draft report  
prepared for further public  
consultation and input.

The Commission will finalise  
its report after these processes  
have taken place.

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#### ***The Productivity Commission***

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

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# Opportunity for further comment

You are invited to examine this draft and make written submissions to the Productivity Commission by 26 November 2010. If you intend to appear at a public hearing, and have not already made a written submission, a summary of the points you wish to discuss should be lodged with the Commission at least two days before.

The final report will be prepared after submissions have been received, and public hearings held, and will be forwarded to the Government by 15 February 2011.

## Public hearing date and venues

Location	Date	Venue
Sydney	4 and 5 November 2010	Adina Apartment Hotel <i>Crown St, Sydney</i>
Canberra	8 and 9 November 2010	Productivity Commission Hearing Room <i>Level 2, 15 Moore St, Canberra</i>
Tamworth	15 November 2010	Quality Hotel Powerhouse <i>Armidale Rd (New England Highway)</i>
Hobart	22 November 2010	Mercure Hotel <i>156 Bathurst St, Hobart</i>
Perth	25 and 26 November 2010	All Seasons Perth <i>15 Robinson Ave, Northbridge</i>
Mildura	30 November 2010	Quality Hotel Mildura Grand <i>Seventh St, Mildura</i>

If you wish to appear at a public hearing, please contact Yvette Goss on (03) 9653 2253, fax (03) 9653 2305, email [rural-research@pc.gov.au](mailto:rural-research@pc.gov.au) or register online at [www.pc.gov.au/projects/inquiry/rural-research](http://www.pc.gov.au/projects/inquiry/rural-research).

## Commissioners

For the purposes of this inquiry and draft report, in accordance with section 40 of the *Productivity Commission Act 1998*, the powers of the Productivity Commission have been exercised by:

Philip Weickhardt

Presiding Commissioner

Dr Cliff Samson

Associate Commissioner

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## Terms of reference

I, NICK SHERRY, Assistant Treasurer, pursuant to Parts 2 and 3 of the *Productivity Commission Act 1998*, hereby refer rural research and development corporation arrangements in Australia to the Productivity Commission for inquiry and report within twelve months of receipt of this reference.

### Outline

Investment in agricultural research and development is undertaken primarily through the Rural Development Corporations (RDCs), State and Territory governments, CSIRO, the tertiary education sector, cooperative research centres and private sector businesses. Total expenditure by all sectors on rural research and development was of the order of \$1.6 billion in 2006-07.

The RDCs, who commission research and development from public and private providers, are funded by a co-investment model based on industry levies and matching Australian Government funding. The Australian Government collects industry levies under legislation for the purpose of research and development and matches expenditure on research and development on a 1:1 basis, up to 0.5 per cent of industry gross value of production. In 2008-09, expenditure by RDCs on R&D was about \$460 million, including \$207 million from the Australian Government. RDCs are accountable to both industry and government for their expenditure.

### Terms of Reference

The review will:

- examine the economic and policy rationale for Commonwealth Government investment in rural R&D;
- examine the appropriate level of, and balance between public and private investment in rural R&D;
- consider the effectiveness of the current RDC model in improving competitiveness and productivity in the agriculture, fisheries and forestry industries through research and development;
- examine the appropriateness of current funding levels and arrangements for agricultural research and development, particularly levy arrangements, and Commonwealth matching and other financial contributions to agriculture, fisheries and forestry RDCs;
- consider any impediments to the efficient and effective functioning of the RDC model and identify any scope for improvements, including in respect to governance, management and any administrative duplication;

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- consider the extent to which the agriculture, fisheries and forestry industries differ from other sectors of the economy with regard to research and development; how the current RDC model compares and interacts with other research and development arrangements, including the university sector, cooperative research centres and other providers; and whether there are other models which could address policy objectives more effectively;
  - examine the extent to which RDCs provide an appropriate balance between projects that provide benefits to specific industries versus broader public interests including examining interactions and potential overlaps across governments and programs, such as mitigating and adapting to climate change; managing the natural resource base; understanding and responding better to markets and consumers; food security, and managing biosecurity threats;
  - examine whether the current levy arrangements address free rider concerns effectively and whether all industry participants are receiving appropriate benefits from their levy contributions.

The Commission is to hold hearings for the purpose of the inquiry and produce a draft and final report.

NICK SHERRY

[Received 15 February 2010]



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# Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ACIAR	Australian Centre for International Agricultural Research
AECL	Australian Egg Corporation Limited
AGS	Australian Government Solicitor
AMPC	Australian Meat Processor Corporation
APL	Australian Pork Limited
ARC	Australian Research Council
AWI	Australian Wool Innovation
CEO	chief executive officer
CRC	Cooperative Research Centre
CRDC	Cotton Research and Development Corporation
CRRDC	Council of Rural Research and Development Corporations
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
FRDC	Fisheries Research and Development Corporation
FWPA	Forest and Wood Products Australia
GRDC	Grains Research and Development Corporation
GVP	gross value of production
GWRDC	Grape and Wine Research and Development Corporation
HAL	Horticulture Australia Limited
IC	Industry Commission
IOC	industry-owned corporation
IP	intellectual property

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LRS	Levies Revenue Service
LWA	Land and Water Australia
MLA	Meat and Livestock Australia
NPSI	National Program for Sustainable Irrigation
OECD	Organisation for Economic Co-operation and Development
PC	Productivity Commission
PIERD Act	<i>Primary Industries and Energy Research and Development Act 1989</i> (Cwlth)
PIMC	Primary Industries Ministerial Council
PISC	Primary Industries Standing Committee
R&D	research and development
RD&E	research, development and extension
RDC	(Rural) Research and Development Corporation
RIRDC	Rural Industries Research and Development Corporation
RRA	(the proposed) Rural Research Australia
SAGIT	South Australian Grain Industry Trust
SFA	statutory funding agreement
SRDC	Sugar Research and Development Corporation



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# OVERVIEW

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## Key points

- Through the Rural Research and Development Corporations (RDCs), rural industries and the Australian Government together invest some \$490 million a year in R&D.
- This co-investment model has important strengths, including: helping to ensure that public money is not spent on research of little practical value; and facilitating greater and faster uptake of research outputs.
  - Especially given the deficiencies in alternative funding vehicles, the case for retaining core elements of the RDC model is very strong.
- However, as the model is currently configured, a significant part of the Government's funding contribution appears to have supported R&D that primary producers would have had sound financial reasons to fund themselves.
  - In terms of buying additional research, the Government's contribution appears to have been of more limited value.
- The Commission is therefore proposing two broad and inter-related changes to the current RDC model.
  - A new, government-funded, RDC — Rural Research Australia (RRA) — should be created to sponsor broader rural research that is likely to be under-provided by industry-specific RDCs. The Government's funding appropriation for RRA should be progressively built up to around \$50 million a year.
  - The industry-specific RDCs should focus predominantly on R&D of direct benefit to their levy payers — but with the cap on the Government's funding contribution gradually reduced to half its current level over 10 years.
- For the first five years, the Government's total funding contribution to the RDC program would be broadly maintained. Though it would then decline somewhat, the still sizeable amount of public funding would be more in keeping with the likely benefits for the wider community from contributing to a program of this nature.
- These changes should be supported by a new set of program principles, setting out the high level conditions that should attach to public funding for the RDCs and the obligations on the Government as a key stakeholder in the program. Some more specific changes should also be made, including to:
  - provide for the consensual appointment of a 'government director' to RDC boards
  - improve the robustness and transparency of project evaluation and the monitoring of program outcomes by the Government.
- This inquiry has also highlighted the need for much better data on funding and spending flows across the totality of the rural R&D framework, and for a mechanism to coordinate the various Australian Government funding programs in this area.
  - However, overlaying the framework with a target level of total spending on rural R&D, or a target 'research intensity', would not be appropriate.

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# Overview

Research and development (R&D) plays an important role in enhancing the productivity and competitiveness of Australia's agriculture, fishing and forestry industries. It can also provide a range of other benefits, including better and lower priced food for consumers and improved environmental and animal welfare outcomes.

A considerable portion of these benefits comes from rural R&D undertaken in other countries and embodied in imported products and technologies used by primary producers. Also, while some of the rural R&D undertaken in Australia is 'cutting edge', much of this domestic research sensibly focuses on the adaptation of knowledge and technologies developed overseas to meet particular local requirements.

Though the available data are far from comprehensive, it appears that current annual funding of rural R&D in Australia is around \$1.5 billion, of which three-quarters is provided by the Australian and State and Territory Governments (see table 1). This public funding is delivered through an array of general and sector-specific programs, with the research in turn conducted by a mix of government and private research providers.

A sizeable part of the Australian Government's funding for rural R&D is provided to Rural Research and Development Corporations (RDCs). These corporations commission rural research on behalf of primary producers and the Government. Primary producers contribute to the cost of this research through industry levies, with the Government's contribution mainly provided on a matching dollar-for-dollar basis. The RDCs are also able to augment this funding with cash and in-kind contributions from other sources (including other government-funded programs). In 2008-09, the RDCs sponsored around \$490 million of rural R&D, with the Government contributing a little under \$220 million to the cost. Further background on the RDC arrangements is provided in box 1.

The RDC 'model' has a number of strengths (see below) and is generally held in high regard in both Australia and overseas. Nonetheless, concerns have been raised about aspects of the arrangements — and especially about the extent to which the Government's funding contribution has helped to address unmet rural research

needs, as opposed to subsidising R&D that primary producers would have had sound financial reasons to fund themselves.

Table 1 **Rural R&D funding: where does the money come from?<sup>a</sup>**

	<i>Funding</i>	<i>Share</i>
	\$m	%
<b>Australian Government</b>		
Cooperative Research Centres	63	
Core funding for the CSIRO	193	
Core funding for the universities	118	
Research and Development Corporations (RDCs)	218	
Other departmental programs	109	
Foregone revenue from the R&D tax concession	9	
<i>Total Australian Government</i>	<i>710</i>	<i>48</i>
<b>State and Territory Governments</b>		
Project-related budget allocations	358	
Capital investment in rural R&D facilities	47	
Payments to other funders and suppliers	19	
<i>Total State and Territory Governments</i>	<i>424</i>	<i>28</i>
<b>Private/Industry</b>		
Levy payments provided to RDCs	248	
Other (for which the R&D tax concession is claimed)	115	
<i>Total Private/Industry</i>	<i>363</i>	<i>24</i>
<b>Total</b>	<b>1497</b>	<b>100</b>

<sup>a</sup> 2008-09 financial year.

Source: Productivity Commission estimates.

Against this backdrop, the Commission has been asked to report on how well the RDC model has been working, whether it should be retained and, if so, how it might be modified to deliver better outcomes for the community. It has also been asked to advise on how much Australia should be spending on rural R&D in total, and how much of that spending should be funded by governments.

## Why should government support rural R&D?

The benefits of investment in rural R&D have been extensively investigated. Though hard to quantify with any precision, there is little doubt that the overall payoff for both primary producers and the community from past investments has been significant.



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### Box 1      **An overview of the RDC ‘model’**

There are currently 15 RDCs — 6 statutory corporations and 9 industry-owned corporations (IOCs). All bar one cover single (though often broad) rural industries (for example, horticulture and grains). The exception is the Rural Industries RDC (RIRDC) which covers several smaller rural industries, as well as sponsoring research on ‘national rural issues’. (Land and Water Australia, which ceased operations at the end of 2009, was also a non-industry-specific entity.)

Most of the current RDCs derive the bulk of their funding from statutory levies on primary producers and matching funding contributions from the Australian Government — generally up to a ceiling of 0.5 per cent of an industry’s gross value of production. Levy payers are able to vote on the rate of the levy.

The RDCs are governed by boards, as well as being subject to various planning, consultation and reporting requirements imposed by the Government as a quid pro quo for its funding contribution.

However, while often characterised as a single model, there are considerable differences in the RDCs’ functions, funding and governance arrangements.

- A key difference is between the statutory corporations and the IOCs. The former are solely responsible for funding R&D and related extension activity, and operate under the *Primary Industries and Energy Research and Development Act 1989* (the PIERD Act). In contrast, the IOCs also have marketing and, in some cases, industry representation functions. Moreover, they are subject to the *Corporations Act 2001*, with the requirements of the PIERD Act replicated through ‘Statutory Funding Agreements’.
- There are further differences within the two types of RDC in regard to such things as stakeholder consultation and board nomination and selection procedures.
- There is considerable variation in the levy arrangements that provide the industry funds to each of the RDCs. As well, RIRDC and the Fisheries RDC receive ‘non-matching’ government funding for ‘public good’ research.

The RDCs operate within a complex broader rural R&D framework.

- An array of Australian and State and Territory Government funding programs are directed at meeting various government priorities and objectives. Public funding responsibilities are further split within levels of government. (For example, funding providers at the Federal level include the Agriculture, Fisheries and Forestry; Innovation; Climate Change; Education; Environment and Foreign Affairs portfolios.)
- Primary producers and other private parties separately fund rural R&D, sometimes assisted by the R&D tax concessions and other general R&D support programs.
- Research management and delivery involves a range of public and private sector entities, including government departments, the RDCs, universities, the CSIRO, Cooperative Research Centres, farming groups and private firms and individuals.

Evaluating how overall funding and delivery responsibilities are shared across the various players is very difficult — not least because of the ‘money-go-round’ that ensues from the multiple funding pools available to those conducting rural R&D.

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However, such benefits are not sufficient to justify public funding. If a primary producer can expect to capture sufficient benefits to make investment in a piece of research privately profitable, then a public funding contribution is unlikely to lead to a different investment outcome. Rather it will simply shift part of the cost of the investment onto taxpayers.

Thus, as most inquiry participants agreed, the main rationale for public funding support dovetails from the un-priced benefits for third parties ('spillovers') that often attach to investments in R&D. Where these spillovers are significant, reliance solely on private funding would potentially lead to under-investment in rural R&D from the community's point of view.

But even here, the broad argument for public funding support requires further unpacking.

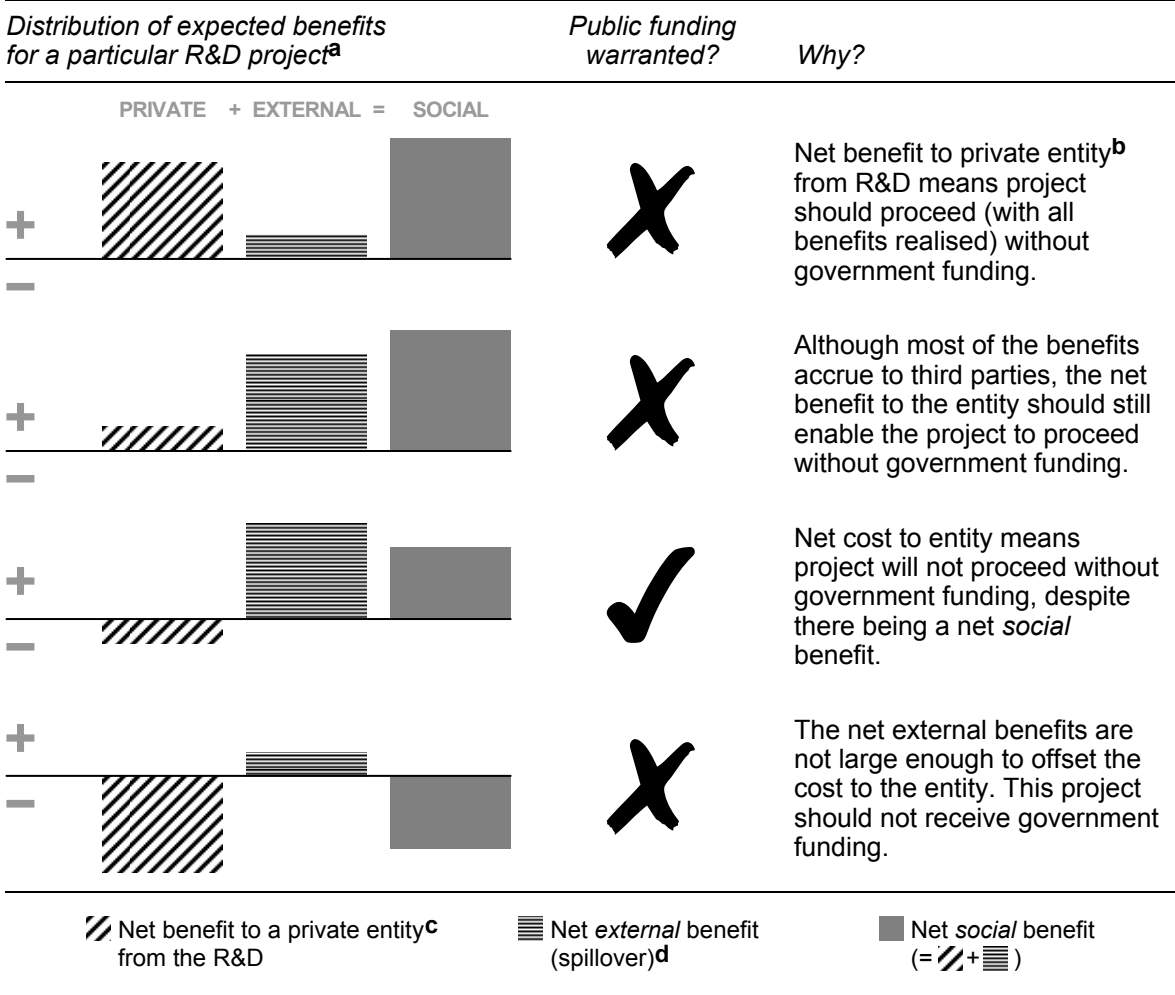
- Spillover benefits attach to many investments and will not automatically justify public funding (see figure 1).
- Public revenue raising has various administrative and efficiency costs. The expected benefit for the community from public funding for rural R&D must therefore be sufficient to cover these costs as well as the direct funding expense. Also, there are many calls on government funds, meaning that the expected benefits from public investment in rural R&D must have regard to the likely payoff for the community from alternative spending options.
- It may be possible to ameliorate the impacts of spillovers in other ways. In relation to rural R&D, for example, industry levy arrangements have long been recognised as a means to help ensure that all primary producers who benefit from research contribute to its cost.

That said, as a means to address under-investment in rural R&D, levy arrangements are not a complete solution. This is because, in the first instance, their role is to address free-rider problems that could preclude worthwhile investment in R&D specific to the industry concerned. Hence, they are less likely to facilitate investment in research where the benefits are either spread thinly across a wide range of industries, or mainly accrue to the wider community. General research into climate change or environmental issues are cases in point. Also, even for industry-specific research, there are reasons why primary producers might not contribute a sufficient amount of funding through levy arrangements to allow all socially worthwhile projects of this nature to proceed.

Given this, there is good reason for government to contribute to the costs of rural R&D. Importantly, however, this public funding should add genuine value. That is,

it should be provided in a way that is likely to induce *additional*, socially valuable, research, rather than merely substituting for private funding.

Figure 1      **Spillovers from R&D do not always justify public funding**



Net benefit to a private entity<sup>c</sup> from the R&D

Net *external* benefit (spillover)<sup>d</sup>

Net *social* benefit (=  $\text{Net benefit to a private entity} + \text{Net external benefit}$ )

<sup>a</sup> Assumes for simplicity that the choice is between whether or not to invest, rather than how much to invest in a particular project stream. However, the same decision-making considerations would still apply for different permutations of the same broad project. <sup>b</sup> The private 'entity' may be an individual firm or the industry as a whole (with private funding in the latter case mobilised through a levy mechanism). <sup>c</sup> Expected net benefits to the private entity are not premised on the receipt of government funding support. Thus, they represent the expected private value of the investment, calculated by applying an appropriate discount rate to future (net) cash flows that reflects both the delayed benefit stream and the uncertainty that attaches to that benefit stream. <sup>d</sup> Includes the administrative and efficiency costs of government revenue raising.

Soundly based rural R&D, partly supported by public funding, may in turn contribute to a range of other goals — such as promoting food security and building stronger regional communities. However, such outcomes are not by themselves sufficient reasons for government to contribute to research costs. Here again, the key requirement is to identify instances where socially worthwhile rural R&D that may have some benefits of this nature would not proceed without public funding support.

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## How well is the RDC model performing?

Input from inquiry participants and various project evaluation evidence suggests that the R&D sponsored by the RDCs has, in aggregate, been of significant benefit to the rural sector and the wider community. Moreover, while much of this benefit has come from higher productivity in the sector, some of the research has also contributed to better environmental and social outcomes.

As a vehicle for planning, funding and delivering rural R&D, the RDC model has important strengths.

- The strong linkages with primary producers, and the significant contribution that those producers make to the cost of the R&D, helps to ensure that money is not wasted on ill-conceived research, or research of limited practical value. Indeed, an important objective in establishing the RDC model was to bring a stronger end user focus to research funding decisions.
- Those same linkages and financial contributions can encourage greater or faster uptake of research outputs by primary producers. This increases the overall value to the community of the research concerned.
- By virtue of their research brokering function and the large amount of cash funding they have at their disposal, the RDCs play a valuable ‘systems integrating’ role. For example, their capacity to influence the projects funded through other rural R&D programs has helped to prevent wasteful duplication of research effort.
- Over the past two decades, the RDCs have accumulated and retained very considerable expertise in the funding and management of rural research. This would be difficult to quickly replicate within a completely different funding vehicle.

Also, many of the criticisms of the model reflect the way it has been implemented in specific cases, and do not call into question the merits of the broad approach.

However, a range of considerations collectively suggest that a significant part of the Government’s funding contribution has helped to support R&D that primary producers would have had sound financial reasons to fund themselves. For instance:

- As noted above, the bulk of this research has been aimed at improving the productivity of the rural sector. With the levy arrangements in place to help address free-rider problems, such research would seemingly have provided a direct, and in many cases bankable, benefit for primary producers.
- High estimated benefit–cost ratios for many RDC sponsored projects — and often within a relatively short period of time — reinforce the notion that the

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incentives for private investment in such research would often have been strong. In fact, in areas like sugar and grains, there has long been a considerable amount of research funded by levies alone.

- The decision taken in 2009 to abolish Land and Water Australia removed public funding from the main area of the RDC program where that funding was most likely to have induced significant new and different research activity.

The preceding observations do not mean that the investments made by the RDCs have been of limited value. To the contrary, without those investments, Australia's rural sector would almost certainly be much less productive and competitive.

But what these observations do imply is that, in helping to address potential under-investment in rural R&D, the levy arrangements rather than the funding contributions from the Government have been the most critical factor. That is, for the sort of industry-specific research that has mainly been targeted by the RDCs, ameliorating the within-industry free rider problem through the levy mechanism would alone do much to help deliver an appropriate level of investment. In comparison, the Government's funding contribution appears to have been of more limited value in buying *additional* research activity. Put another way, the Commission's judgement is that removing the ability to collect compulsory industry levies would have a much more significant impact on the level of industry-specific rural R&D ultimately carried out, than a reduction in the Government's co-contribution.

## **Improving the broad framework**

As input to this inquiry illustrates, there is a widely held view that the community could get greater value from the \$1.5 billion spent on rural R&D each year, and particularly from the more than \$1.1 billion provided by governments. While improvements to the RDC model are clearly important in this regard, they are only one of many avenues for delivering better outcomes.

However, the Commission has not undertaken a comprehensive assessment of the broader framework.

- To have done so would have risked extensive duplication with several other framework review and improvement processes that are currently in train.
- A significant amount of government funding for rural R&D comes through programs which are not specific to the rural sector and which could therefore not be assessed solely on the basis of their impacts in this one sector.

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Rather, the Commission has focused on the broad funding level issues specified in the terms of reference, and on a small number of specific framework issues that have been particularly germane to its assessments of the RDC arrangements.

*Should Australia target a particular level of spending on rural R&D?*

Though it seems clear that past investments in rural R&D have provided a significant return to the community, this provides little guidance on whether Australia should be spending more or less in this area in the future. Similarly, considerable caution is required in drawing strong conclusions from recent empirical work linking a slowdown in productivity growth in broadacre agricultural industries since the mid-1990s to reduced public sector spending on R&D. Productivity growth rates for individual rural industries have not been uniform, with data compiled by the Commission suggesting that, for the sector as a whole, it is unclear whether trend productivity growth has in fact slowed to any great extent. Also, deficiencies in the data on overall funding for rural R&D (see below) preclude reliable estimates of trends in funding and spending levels, or analysis of the extent to which any fall in public funding may have been offset by higher private funding.

More generally, seeking to boost spending (public or private) on rural R&D without reference to specific research needs and outputs — or setting broad targets for research intensity — would be poor policy. For example, putting additional public money into under-performing programs, or providing incentives that made private investment in projects of low value appear to be worthwhile, would clearly be counterproductive. Rather, the focus should be on ensuring that settings within the framework facilitate best use of available public and private funds and timely and effective funding responses to emerging needs.

*Should governments be contributing more or less?*

Several considerations suggest that, collectively, Australian governments are currently shouldering too much of the funding load for rural R&D. The public sector share of total funding (around 75 per cent) is nearly double that for R&D across the economy as a whole. Though the rural sector has some distinguishing characteristics (see later), they do not justify this level of disparity. In many other developed countries, primary producers and other private parties meet a considerably higher share of the cost of rural research activity.

Again, however, targeting a pre-determined, lower, public-private funding share would not be appropriate. One consequence might be cuts in public funding for meritorious programs. Instead, the ‘right’ shares — and in turn the ‘right’ overall

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level of public funding — should emerge from an assessment of all relevant programs against an agreed set of principles that clearly spell out the basis on which public funding support should be provided (see next section).

### *An overarching set of public funding principles*

Basing government funding (or other forms of intervention) on clear and soundly based principles is widely recognised as being important in delivering good outcomes. As well as giving consistent direction to those responsible for implementing funding programs and conditioning the expectations of stakeholders, such principles can also provide a benchmark for evaluating performance and thereby promote accountability for outcomes achieved.

The lack of an overarching set of principles to guide public funding provided through the various rural R&D programs is a significant deficiency in the current rural R&D framework. By way of illustration, the stated objectives of the PIERD Act make no reference to how the Government's contribution to the RDCs can, and should, specifically help to meet a list of desired outcomes. Similarly, as the decision to abolish Land and Water Australia exemplifies, some past reductions in government funding have been heavily influenced by short-term budgetary considerations, as distinct from judgements about the fundamental merits of a public contribution towards the cost of the R&D concerned.

The set of public funding principles which the Commission is proposing cover a range of matters including: the basis for government to contribute to the cost of rural R&D; the relationship of R&D funding programs with other policies affecting the performance of the rural sector; and design features that are likely to enhance the efficiency and effectiveness of individual funding programs.

### *Improving the rural R&D data base*

An important revelation in this inquiry has been the paucity of reliable data that are available on what is happening across the totality of the rural R&D framework. Such information gaps will inevitably have compromised the effectiveness of past decision-making.

Of paramount concern is the absence of robust data on funding and spending flows within the framework. As a result, it is hard to be certain about how much is being spent, with whom it is being spent, and which parties are ultimately providing the funding. Information on private funding for rural R&D, over and above contributions via industry levies, is particularly limited.

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While there are a number of challenges in assembling better data, the Commission's endeavours suggest that there is ready scope for improvements in this area. Notably, when funding circularities within the 'money-go-round' are netted out, it is apparent that the Australian Government is shouldering a considerably greater share of the overall funding load, and State and Territory Governments a smaller share, than has generally been perceived to be the case. Suffice to say that a concerted push to improve the framework data base should be a high priority.

### *Improving program and policy coordination*

Where innovation and R&D matters are involved, special care is required to ensure that program and policy coordination initiatives do not unduly diminish diversity, flexibility and competition. Coordination initiatives motivated by a desire for a more 'strategic' approach to research also carry the risk that governments will assume too great a role in directing outcomes, or attempt to 'pick winners'.

Even so, the Commission sees value in some sort of lower key mechanism to better coordinate the Australian Government's very substantial funding contribution for rural R&D. As indicated in box 1, this funding is channelled through a variety of individual programs, many of which do not reside within the agriculture, fisheries and forestry portfolio. In consequence, it appears that decisions concerning individual programs are often made without sufficient regard to the alternative funding vehicles available, or to what the policy framework as a whole is intended to achieve.

Other framework issues canvassed in the report include: the balance between departmental and devolved program management, the scope to reduce unproductive shifting of research costs, the role of government in the extension area, improving access to information and other building blocks for future rural research, and addressing impediments to the private sector taking a greater role in funding and delivering rural R&D.

### **A modified RDC model should be retained**

While there are some shortcomings in the current RDC model, it is highly unlikely that a completely different approach would deliver as good an outcome for the community.

- Reallocating the Australian Government's current funding contribution to the RDCs to either CSIRO or the universities would lessen interaction with primary producers — leading to fewer reality checks on the worth of R&D and slower



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uptake of research outputs. There would also be less competition in the supply of the research concerned.

- Reallocating the Government's contribution to departmental programs would similarly lessen interaction with primary producers and would also require new and potentially costly mechanisms to channel funds to research suppliers. Deficiencies in program management skills within some government departments could further detract from the outcomes delivered by this approach.
- Relying solely on the generally available R&D tax concession would be problematic on practical grounds. More fundamentally, it would not recognise the potential case for providing somewhat higher public support for rural R&D; and would entail a large and disruptive short-term reduction in the funding available for such research.

The case for retaining core elements of the RDC model is therefore very strong.

However, as indicated above, it appears likely that the Government's very significant funding contribution has induced only a modest overall level of genuinely additional research.

Moreover, without substantial changes to the model, it is likely to be difficult to get better value for the wider community from the Government's contribution. This is because the bulk of that funding contribution is currently bundled with contributions from levy payers — meaning that any change in the way the Government's contribution is spent will also affect how levy payers' funds are spent. Hence, any attempt to significantly lessen the industry-specific focus of R&D procured with this bundled funding, could see levy payers vote to reduce or terminate their levies. This could then threaten the continuation of the whole co-investment regime.

The Commission is therefore proposing two broad and inter-related changes to the current RDC model.

First, the Government should create and fund a new non-industry RDC — Rural Research Australia (RRA) — to sponsor broader rural research that is likely to be under-provided by industry-specific RDCs. Though having similarities with the previous Land and Water Australia, RRA's remit would be broader — encompassing energy use as well as land and water matters. Especially with pressure for greenhouse gas abatement, there are likely to be many opportunities for socially valuable, energy-related, research which will not fit neatly within the research portfolios of the industry-specific RDCs. There may also be opportunities for RRA to take responsibility for relevant land, water and energy research that is currently funded and managed through other Australian Government programs.

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Second, with RRA responsible for funding broader rural research, the industry-specific RDCs should be left to focus predominantly on R&D of direct benefit to their levy payers. This would not obviate the need for these RDCs to collaborate with their counterparts and other research entities. Even for industry-focused work, collaboration will often be a means to improve efficiency and research quality, and to allow for investment in larger, potentially ‘game changing’, projects. However, the narrower research focus would remove the tensions that have arisen under the current arrangements from the attempt to use industry-specific RDCs to simultaneously meet broader research needs. Consequent upon this change in research focus, the Australian Government’s contributions to the industry-specific RDCs should be gradually reduced as set out below.

### *Funding arrangements*

The appropriate amount of government funding for RRA will depend on its precise remit. Nonetheless, two considerations suggest that the amount should be significantly greater than was provided to the former Land and Water Australia.

- RRA’s remit would be wider, and considerably so were it to assume responsibilities for funding research currently supported through other programs.
- Though RRA would be able to augment its government appropriation with funding from other sources, it should not have to rely too greatly on leveraging contributions from third parties. Especially were RRA to become heavily reliant on funding from particular industries, then the intended broad nature of its research portfolio could be compromised.

The Commission’s judgement is that an appropriation for RRA of around \$50 million a year would ultimately be warranted, with additional funding provided for any research responsibilities transferred to the new entity from other programs. However, it would clearly take some time for RRA to gear up a research portfolio commensurate with government funding of this magnitude. Thus, its funding appropriation should be progressively built up to the target level.

The Commission further considers that with RRA in place to fund broader rural research, and with the levy arrangements helping to prevent free riding on industry-focused R&D, the case for gradually reducing government funding for the industry-specific RDCs would be strong.

- The current level of funding support for rural R&D via the matching contribution arrangements is, in a relative sense, extremely generous — between 3 and 11 times the rate of assistance provided to other industries by the generally available R&D tax concession. Neither the nature of the rural sector, nor the type

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of research that is currently sponsored by the industry-specific RDCs, warrants a disparity of this magnitude.

- The disparity would be even more inappropriate once responsibility for funding broader rural R&D was shifted to RRA. Indeed, with the levy arrangements in place, the case for any disparity in funding support for industry-focused research sponsored through the RDC arrangements would, at face value, be questionable.

However, there are in fact efficiency arguments for not seeking to remove all of the current assistance disparity. Most importantly, even for industry-focused R&D, levy arrangements are unlikely to completely overcome the ‘market failures’ that could lead primary producers to under-invest in such research.

There is also the risk that a large and immediate reduction in the Government’s contribution to the industry-specific RDCs might prompt a similarly large reactive and destabilising reduction in industry funding. Furthermore, in considering the rate at which government support for these RDCs might reasonably be reduced, the Commission has been cognisant of other funding pressures in the system. For example, funding for rural R&D provided by some State Governments has been declining and there are indications that, in future, it may be more difficult for rural industries to qualify for funding under the Cooperative Research Centres program.

Taking all of these factors into account, the Commission is proposing that the cap on the matching government contribution for industry-specific RDCs be gradually reduced over ten years to half its current level — that is, to 0.25 per cent of an industry’s ‘gross value of production’ (GVP).

- This change would not affect the unmatched government funding provided to the Fisheries RDC for wider public good research (nor, in practice, its matching government contributions which are already capped at 0.25 per cent of GVP).
- Similarly, that part of RIRDC’s appropriation used to match voluntary contributions from generally smaller, and in many cases emerging, rural industries should be maintained. (However, the Commission is seeking further input on whether RIRDC’s public good research, and the associated component of its funding appropriation from the Government, should be transferred to RRA.)

The implications of these proposals for the Government’s total contribution to the RDC program would depend on several factors — including the precise remit and funding for RRA and trends in rural industry output.

Initially, however, the primary impact would be a gradual reallocation of some government funding from the industry-specific RDCs to the new RRA. Thus, if funding for RRA were built up to the indicative \$50 million target over five years,

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then the proposed package would effectively maintain the Government's current total contribution for this period.

At the end of the 10-year phase down of the matching contribution cap for the industry-specific RDCs, the Government's total contribution to the RDC program would be around \$60 million a year lower (based on current industry production values and netting out any additional funding accompanying the transfer of research functions to RRA from other programs). However, the still sizeable amount of support — up to \$165 million a year (on the same basis) — would be more in keeping with the likely benefits for the wider community from contributing to a program of this nature.

The Commission further notes that were the Government to decide that a larger total public contribution to the RDC program would be appropriate, it would become even more important that a sizeable part of that contribution was used to create and fund RRA. Put another way, whatever the total public funding commitment, using that funding solely to support the activities of industry-specific RDCs is highly unlikely to provide the best return to the community.

### **More detailed changes to the RDC model and levy arrangements**

Complicating the proposed revamp of the RDC model with a large number of more detailed changes would not be helpful. Indeed, it is highly desirable that the scope for the RDCs to tailor a general set of requirements to meet their particular needs is retained.

But such flexibility will only be effective in delivering good outcomes if there is a sound set of operating principles to guide the actions of both the RDCs and the Government as a key stakeholder in the co-investment model. Hence, the set of principles proposed by the Commission (see box 2) sets out:

- broad requirements that RDCs should meet as a condition for the receipt of public funding
- obligations on the Government, including to engage constructively with the RDCs and, very importantly, to effectively monitor their performance and take prompt and appropriate action where agreed standards are not met.

The Commission has also recommended some specific changes to promote these principles, as well as to further enhance the flexibility of the model, including:

- reduced Ministerial involvement in the priority setting and planning processes of the industry-specific RDCs — but with enhanced measures (see below) to help

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ensure that government funding is not simply used to subsidise short-term, low risk, adaptive research

- provision for statutory RDCs (if a majority of levy payers agree) to undertake *industry-funded* marketing activity, thereby removing the current distinction with the industry-owned corporations

#### **Box 2      Principles to guide the future operation of the RDC program**

As a condition of receiving government funding, RDCs should:

- invest in a balanced project portfolio that includes longer-term, riskier and potentially higher-reward research, as well as short-term, low-risk, adaptive research
- have in place effective processes to ensure timely adoption of research results
- use government funding solely for R&D and related extension purposes and not for any marketing, industry representation or agri-political activities
- promote effective communication with industry stakeholders, researchers and the Australian Government
- publish information on the outcomes of all completed research projects in a timely manner
- implement board selection processes that result in boards with an appropriate balance of relevant skills and experience, rather than a balance of representative interests
- pursue ongoing improvements in administrative efficiency
- undertake rigorous and regular ex ante and ex post project evaluation
- participate in regular and transparent independent performance reviews
- remedy identified performance problems in an effective and timely manner.

For its part, the Australian Government should:

- engage openly and constructively with RDCs and their industry stakeholders
- discharge its administrative responsibilities in relation to the RDC program in a timely and efficient fashion
- ensure that nominated representative bodies for each of the statutory RDCs continue to be suitably representative of the interests of the industries concerned, and not dependent on funding from the RDCs they are meant to oversight
- monitor the RDCs' performance in a way that will enable transparent assessment of the outcomes of the program as a whole and identification of specific performance problems
- effectively communicate with RDCs in regard to opportunities to improve performance, and take prompt and appropriate action if performance problems are not satisfactorily addressed.

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- provision for both statutory and industry-owned RDCs to request the appointment of a ‘government director’ to their boards where they consider this would complement board skills and improve dialogue with the Government
  - a requirement for all RDCs to participate in a regular, comprehensive, transparent, program-wide, project evaluation process — such as that currently sponsored by the Council of Rural Research and Development Corporations
  - extension to all statutory RDCs of the current requirement for the industry-owned RDCs to commission independent performance reviews at least every three years. All such performance reviews should be publicly available and, amongst other things, explicitly examine:
    - whether project portfolios meet the ‘appropriate research balance’ principle
    - the scientific merit of the research involved
    - whether research outcomes have been sufficiently accessible to facilitate timely uptake by all levy payers and to assist other researchers
  - the preparation by the Department of Agriculture, Fisheries and Forestry (DAFF) of a consolidated, publicly available, annual report on the activities of the RDCs — including details of any breaches by RDCs of their obligations and the steps that have been, or will be, taken to address those breaches.

The latter two initiatives are particularly important. Even with the Commission’s proposed changes in place, government funding for industry-specific rural R&D sponsored through the RDC program would still be very generous. It is therefore appropriate that there are mechanisms in place to help ensure that this contribution is making a difference to the type of research being conducted. Many of the RDCs already recognise this and invest in the sort of longer-term and riskier research that would potentially be under-provided if there were reliance on levy funding alone. But those that continue to invest exclusively or primarily in small scale, low risk, adaptive R&D should not expect to continue to have this research supported by the taxpayer.

A further weakness in the current arrangements is that the sanctions available to the Minister to deal with un-remediated breaches of obligations by an RDC are limited. Indeed, for the industry-owned corporations, the only real sanction is the withdrawal of funding — an action that would also penalise primary producers and research providers were it ever to be used. Accordingly, the Commission is seeking further input on whether there are any ‘intermediate’ sanctions that could be more readily invoked by the Minister — and which might be more likely to induce appropriate remedial action by an under-performing RDC than the current approach

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of simply relying on public and private admonition and/or a greater degree of prescription about how that RDC should behave in the future.

Notably, the current approach appears not to have been very effective in dealing with what are widely perceived to be significant and ongoing performance issues within Australian Wool Innovation (AWI). As well as concerns about the direct impacts on the returns to levy payers and the community from AWI's R&D investments, several stakeholders pointed to the potential for instability and unresolved performance issues within AWI to degrade confidence in the RDC model as a whole.

In the Commission's view, this situation should not be allowed to continue. AWI's recently renewed Statutory Funding Agreement and the 2009 independent review of its performance detail a range of specific issues that need to be addressed by AWI. If the next three-yearly independent performance review of AWI indicates that appropriate remedial action has not been taken — and if a meaningful intermediate sanction cannot be found — then the case for the Government to withdraw its funding for AWI would become compelling.

Also, the Commission is proposing:

- a small number of changes to make it easier for primary producers to increase their levy contributions and thereby enhance their capacity to fund research of direct benefit to them
- a further, independent, public review once the new RDC arrangements have been fully implemented.

In the report, the Commission has also commented on other aspects of the RDC arrangements, including executive remuneration matters and possible avenues for improving administrative efficiency. However, given developments already in train in these areas — and with the proposed broader principles governing public funding for the RDCs and enhanced performance monitoring mechanisms in place — the Commission has concluded that no specific initiatives are warranted at this time.

### **Why would the community as a whole be better off?**

As outlined above, for the first five years of the Commission's proposed new arrangements, the Australian Government's total funding contribution to the RDC program would be broadly unchanged. That is, there would simply be a reallocation of some of that contribution from support for the industry-specific RDCs to support for more broadly based rural research via the new RRA.

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Over the next five years, total public funding for the RDC program would gradually decline as the cap on the matching contributions for industry-specific RDCs was further reduced.

However, it would be wrong to judge the merits of the proposed changes solely, or even largely, on the basis of their implications for the total amount of government funding provided to RRA and the industry-specific RDCs.

- In the first instance, in light of the potential significant benefits that industry-specific rural R&D can have for primary producers' 'bottom lines', producers would have a commercial incentive to fill at least part of the funding gap. Indeed, it is for this very reason that industry-specific rural R&D is already undertaken outside of the RDC program with little or no public support.
- More importantly, the change in total public funding is not a good indicator of how the wellbeing of the community as a whole would be affected. The current arrangements involve very large subsidies for research that primary producers would often have sound financial reasons to fund themselves. Subsidies of this nature are intrinsically no less wasteful than other instances of poorly targeted public spending.

Through a gradual reduction in the subsidies for industry-focused R&D of direct benefit to primary producers, together with the creation of RRA to fund the sort of broader rural research that has been under-provided to date, the Commission's package would better align the benefits received and the costs incurred by the various parties. Thus, notwithstanding the decline in total public funding support for the RDC program, the community as a whole would be better off.



## The draft recommendations at a glance

<i>Recommendation</i>	<i>Targeted benefits</i>
<b>Public funding principles</b>	
<ul style="list-style-type: none"> <li>Institute an overarching set of public funding principles covering: the basis for government to contribute to the cost of rural R&amp;D; the relationship with other policy levers; and good program design features.</li> </ul>	<ul style="list-style-type: none"> <li>Provision of clear and consistent guidance on what public funding is intended to achieve and how those goals are best pursued. Improved program evaluation and thereby greater accountability.</li> </ul>
<b>Framework data collection and program coordination</b>	
<ul style="list-style-type: none"> <li>Establish a process to collect and maintain robust data on funding and spending flows within the framework.</li> </ul>	<ul style="list-style-type: none"> <li>Address a major information impediment to effective policy making in the rural R&amp;D area.</li> </ul>
<ul style="list-style-type: none"> <li>Establish a mechanism to coordinate the Australian Government's various funding programs for rural R&amp;D.</li> </ul>	<ul style="list-style-type: none"> <li>Decisions to introduce new programs, or adjust funding for specific programs, less likely to be made in isolation.</li> </ul>
<b>Changes to the configuration of, and funding for, the RDC model</b>	
<ul style="list-style-type: none"> <li>Create a new RDC, 'Rural Research Australia' (RRA), to sponsor non-industry specific rural R&amp;D. Leave industry-specific RDCs to focus on research of direct benefit to levy payers.</li> </ul>	<ul style="list-style-type: none"> <li>Remove the tensions that arise under the current arrangements from the attempt to use industry-specific RDCs to simultaneously meet both industry and broader research needs.</li> </ul>
<ul style="list-style-type: none"> <li>Progressively build up government funding for RRA to around \$50 million a year (with additional funding provided for any research responsibilities transferred from other programs). Over ten years, reduce government funding for the existing, industry-specific, RDCs to half the current rate.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce unnecessary subsidisation of research that primary producers would have had sound financial reasons to fund themselves, and use some of the savings to fund the sort of broader rural research that has been under-provided by the current arrangements.</li> </ul>
<b>Principles to guide the future operation of the RDC program</b>	
<ul style="list-style-type: none"> <li>Implement a set of principles setting out the conditions that should attach to public funding for RDCs and the obligations on the Government as a key stakeholder in the program.</li> </ul>	<ul style="list-style-type: none"> <li>Greater flexibility for RDCs to tailor requirements to their particular circumstances, subject to them meeting overall performance obligations. More onus on the Government to engage constructively with the RDCs and take effective action where an RDC breaches its obligations.</li> </ul>
<b>Specific changes to help give effect to those principles</b>	
<ul style="list-style-type: none"> <li>Lessen Ministerial involvement in the priority setting and planning processes of the industry-specific RDCs.</li> </ul>	<ul style="list-style-type: none"> <li>Greater scope for RDCs to bring their expertise to bear in the formulation of research portfolios and reduced administrative costs.</li> </ul>
<ul style="list-style-type: none"> <li>Allow statutory as well as industry-owned RDCs to take on industry-funded marketing functions.</li> </ul>	<ul style="list-style-type: none"> <li>Realisation of synergies and administrative efficiencies through the combination of functions.</li> </ul>
<ul style="list-style-type: none"> <li>Defer assessment of whether industry representation should be a generally allowable RDC function until next review (see below).</li> </ul>	<ul style="list-style-type: none"> <li>Assessment informed by experience with stronger proscriptions on agri-political activity in statutory funding agreements.</li> </ul>

(Continued next page)

## The draft recommendations at a glance (continued)

<i>Recommendation</i>	<i>Targeted benefits</i>
<ul style="list-style-type: none"> <li>• Provide for the consensual appointment of a 'government director' to RDC boards.</li> </ul>	<ul style="list-style-type: none"> <li>• Complement existing RDC board skills and improve dialogue with the Government.</li> </ul>
<ul style="list-style-type: none"> <li>• Require all RDCs to participate in a regular, comprehensive and transparent program-wide project evaluation process.</li> </ul>	<ul style="list-style-type: none"> <li>• Better information on project outcomes with flow on benefits for future investments.</li> </ul>
<ul style="list-style-type: none"> <li>• Require all RDCs to commission regular, independent, performance reviews, including an assessment of the balance in their portfolios between short-term and longer-term research; the scientific merit of that research; and whether research outcomes have been sufficiently accessible to all levy payers and other researchers.</li> </ul>	<ul style="list-style-type: none"> <li>• Through extension and augmentation of the requirement already in place for industry-owned RDCs, enhance performance disciplines and the quality of research, and help ensure that potentially high payoff research is not ignored.</li> </ul>
<ul style="list-style-type: none"> <li>• Require DAFF to prepare a consolidated, publicly available, annual report on RDC program outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>• More onus on the Government to effectively monitor the RDC program and take prompt and effective action to deal with any ongoing poor performance by an RDC.</li> </ul>
<b>Levy arrangements</b>	
<ul style="list-style-type: none"> <li>• Abolish product-specific maximum levy rates.</li> </ul>	<ul style="list-style-type: none"> <li>• Removal of an impediment to primary producers taking on a greater role in funding rural R&amp;D.</li> </ul>
<ul style="list-style-type: none"> <li>• Streamline those parts of the levy principles and guidelines dealing with changes to levy rates.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that the costs for rural industries of seeking levy changes are commensurate with the magnitude of the change.</li> </ul>
<ul style="list-style-type: none"> <li>• Introduce an indicative time limit of six months for implementing a levy proposal that complies with the relevant requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the discipline on DAFF to process levy change proposals in an expeditious fashion.</li> </ul>
<ul style="list-style-type: none"> <li>• Require the Levies Revenue Service to routinely monitor its performance and promptly communicate the results to levy payers.</li> </ul>	<ul style="list-style-type: none"> <li>• Greater surety for levy payers that there is minimum leakage of their levies to collection costs.</li> </ul>
<b>Further review</b>	
<ul style="list-style-type: none"> <li>• After the new RDC arrangements have been fully implemented, undertake a further, independent, public review.</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity to examine how the new arrangements have influenced program outcomes and what further changes should be made, including in response to changes in other parts of the rural R&amp;D framework.</li> </ul>

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# Draft recommendations, findings and information requests

## Overall spending on, and funding for, rural R&D

DRAFT FINDING 5.1

*It would not be appropriate to establish a target level for overall spending on rural R&D — nor a target for rural R&D intensity. Rather, the emphasis should be on ensuring that the policy framework is comprehensive and soundly based, and that settings within the framework facilitate efficient use of available public and private funding, and timely and effective funding responses to emerging needs.*

DRAFT FINDING 5.2

*Setting an indicative target for the share of total spending on rural R&D to be met by governments would be a blunt, and quite possibly counterproductive, approach. Rather, the appropriate share — and in turn the appropriate overall level of public funding — should ‘emerge’ from:*

- an assessment of all of the various programs through which governments currently contribute funding to rural R&D against the public funding principles spelt out in draft recommendation 5.1; having particular regard to the characteristics of the R&D conducted and thus the likelihood that public funding will induce a commensurate amount of additional, socially valuable, research*
- any evidence that the current program portfolio is failing to cater for particular types of socially valuable rural R&D that would meet the additionality requirement for public funding support.*

## Public funding principles

DRAFT RECOMMENDATION 5.1

*The Australian Government should incorporate the following high level public funding principles in all of its rural R&D policies and funding programs.*

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- *The primary aim of government funding is to enhance the productivity, competitiveness and social and environmental performance of the rural sector and the welfare of the wider community by inducing socially valuable R&D that would not otherwise be undertaken.*
  - *Public funding programs for rural R&D should:*
    - *give appropriate recognition to non-R&D related drivers of performance improvement in the rural sector*
    - *facilitate, or at least not impede, structural adjustment in the sector*
    - *be consistent with other policies and programs designed to improve the performance of the sector.*
  - *The design of individual funding programs should:*
    - *encourage the efficient delivery of quality research outputs, including through promoting effective intra- and inter-program coordination*
    - *build in appropriately resourced mechanisms to facilitate the adoption of worthwhile research outputs*
    - *promote transparency and accountability in regard to program outcomes through effective governance, evaluation and reporting requirements*
    - *promote transparency in funding flows and discourage leveraging behaviour that is administratively costly and/or designed solely to shift costs.*

*The Australian Government should further:*

- *commit to regular independent review of its various rural R&D programs against these principles*
- *through the Primary Industries Ministerial Council, seek the agreement of State and Territory Governments to incorporate the principles and the review requirement:*
  - *in all of their rural R&D policies and funding programs*
  - *in the National Primary Industries RD&E Framework initiative.*

## **Framework data collection and program coordination**

DRAFT RECOMMENDATION 5.2

*In consultation with its State and Territory Government counterparts, the Department of Agriculture, Fisheries and Forestry should establish a process for assembling and maintaining robust data on:*

- 
- *total funding for rural R&D in Australia — including from R&D programs not specific to the rural sector, and indirectly through the charging practices of government research suppliers*
  - *the respective shares of that funding provided by governments and private parties*
  - *the programs and other channels through which this funding is spent, and the way in which spending is delineated across the main rural R&D provider groups.*

DRAFT RECOMMENDATION 5.3

*The Australian Government should establish a mechanism to better inform and coordinate the totality of its funding for rural R&D with a view to:*

- *promoting consistency in approaches across specific and more general Australian Government programs that provide funding for rural R&D*
- *assisting in the identification of gaps or unnecessary overlaps in program coverage and means to address them*
- *informing considerations of the effectiveness of overall Australian Government funding support for rural R&D*
- *ensuring that the States and Territories and other relevant entities are fully aware of changes in Australian Government funding programs and the likely implications for other rural R&D funding arrangements.*

INFORMATION REQUEST

*The Commission seeks further input from participants on what precise form this new mechanism should take and what particular functional responsibilities should be encompassed within it.*

## **Changes to the configuration of, and funding for, the RDC model**

DRAFT RECOMMENDATION 6.1

*The Australian Government should retain a modified Rural Research and Development Corporation (RDC) model.*

- *It should establish and fund a new RDC, ‘Rural Research Australia’ (RRA) to sponsor non-industry specific R&D intended to promote productive and sustainable resource use by Australia’s rural sector.*
  - *RRA’s remit should broadly encompass land, water and energy use, with the precise coverage of its activities determined having regard to the further input to this inquiry.*

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- *‘As part of that coverage decision, consideration should be given to the benefits and costs of bringing the ‘national rural issues’ R&D that is currently the responsibility of the Rural Industries RDC within the new entity.*
  - *However, RRA’s remit should not extend to the sector-specific ‘public good’ research undertaken by the Fisheries RDC.*
  - *RRA should be created as a statutory R&D corporation under the Primary Industries and Energy Research and Development Act 1989 (Cwlth).*
    - *It should be funded by an annual appropriation from the Australian Government under a quadrennial funding agreement.*
    - *RRA should be able to supplement its appropriation from the Australian Government with funding from other sources, including from other RDCs.*
  - *Following the establishment of RRA, the other RDCs — except for the Fisheries RDC — should focus predominantly on sponsoring R&D of direct benefit to their levy payers.*
  - *In consequence, the funding contributions from the Australian Government for all of the existing RDCs, except for the Fisheries RDC, should be gradually reduced (see draft recommendation 7.1).*

#### DRAFT RECOMMENDATION 7.1

*The Australian Government should contribute to the cost of rural R&D sponsored by the Rural Research and Development Corporations (RDCs) on the following basis:*

- *There should be direct appropriations for the proposed new RDC, Rural Research Australia (RRA); for ‘public-good’ research sponsored by the Fisheries RDC; and for ‘national rural issues’ research sponsored by the Rural Industries RDC (RIRDC), unless responsibility for this research is transferred to RRA (see draft recommendation 6.1).*
- *The appropriation for RRA should be progressively increased over five years to around \$50 million a year, with additional funding provided for any research responsibilities transferred to the new entity from other programs (see draft recommendation 6.1).*
- *The Australian Government should continue to link its funding for the industry-specific RDCs to contributions made by the industries concerned.*
  - *However, the cap on matching contributions for all statutory levies should be reduced from 0.50 per cent to 0.25 per cent of an industry’s gross value of production (GVP). This reduction should be phased in over ten years,*

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*with the cap reducing by 0.025 per cent of GVP each year during this period.*

- *The appropriation for RIRDC should allow it to continue to match voluntary industry contributions at the current level.*

#### INFORMATION REQUEST

*The Commission seeks further input on the appropriate remit and funding for the proposed Rural Research Australia (RRA) and, in particular, on:*

- *areas and types of non-industry specific rural R&D that would be relevant to promoting productive and sustainable resource use by the sector*
- *opportunities to beneficially consolidate funding and management of research that is currently the responsibility of other entities within this new Research and Development Corporation*
- *whether \$50 million a year, plus additional funding for any research responsibilities transferred from other programs, would be a reasonable target for the government appropriation for RRA having regard to:*
  - *the desirable breadth of the entity's research remit*
  - *the extent of unmet, socially valuable, research needs within that remit*
  - *the appropriate degree of leveraging for an entity of this nature*
- *the rate at which RRA's funding appropriation could reasonably be increased towards the target level.*

### **Principles to guide the future operation of the RDC program**

#### DRAFT RECOMMENDATION 8.1

*As a condition of receiving government funding, Rural Research and Development Corporations (RDCs) should:*

- *invest in a balanced project portfolio that includes longer-term, riskier and potentially higher-reward research, as well as short-term, low-risk, and adaptive research*
- *have in place effective processes to ensure timely adoption of research results*
- *use government funding solely for R&D and related extension purposes and not for any marketing, industry representation or agri-political activities*
- *promote effective communication with industry stakeholders, researchers and the Australian Government*

- 
- *publish information on the outcomes of all completed research projects in a timely manner*
  - *implement board selection processes that result in boards with an appropriate balance of relevant skills and experience, rather than a balance of representative interests*
  - *pursue ongoing improvements in administrative efficiency*
  - *undertake rigorous and regular ex ante and ex post project evaluation*
  - *participate in regular and transparent independent performance reviews*
  - *remedy identified performance problems in an effective and timely manner.*

*For its part, the Australian Government should:*

- *engage openly and constructively with RDCs and their industry stakeholders*
- *discharge its administrative responsibilities in relation to the RDC program in a timely and efficient fashion*
- *ensure that nominated representative bodies for each of the statutory RDCs continue to be suitably representative of the interests of the industries concerned, and not dependent on funding from the RDCs they are meant to oversee*
- *monitor the RDCs' performance in a way that will enable transparent assessment of the outcomes of the program as a whole, and identification of specific performance problems*
- *effectively communicate with RDCs in regard to opportunities to improve performance, and take prompt and appropriate action if performance problems are not satisfactorily addressed.*

## **Specific changes to help give effect to the principles**

### **DRAFT RECOMMENDATION 8.2**

*Consistent with the overarching public funding principles for the rural R&D framework (see draft recommendation 5.1), the legislation and statutory funding agreements for Rural Research and Development Corporations (RDCs) should indicate that the ultimate objective of the public funding they receive is to induce socially-worthwhile rural R&D that would not otherwise be undertaken.*

*With that guidance and the RDC-specific principles (see draft recommendation 8.1) in place, requirements for formal Ministerial involvement in priority setting and approving RDCs' plans should be removed, except for the Fisheries RDC and Rural Research Australia.*



*The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that the statutory Rural Research and Development Corporations (RDCs) can add marketing to their functions, where this is supported by the majority of levy payers and approved by the Minister for Agriculture, Fisheries and Forestry. The amendments should ensure that government contributions to any RDC that takes on marketing functions are only used to fund research and development, as defined in the Act.*

*The case for making industry representation a generally-allowable function for any RDC — statutory or industry-owned — should be considered as part of the proposed future review of the new RDC arrangements (see draft recommendation 9.5). In the interim, the two RDCs that already have an industry-representation role — the Australian Egg Corporation and Australian Pork Limited — should be allowed to maintain that function.*

*Provision should be made in statutory funding agreements for the Australian Government to appoint a director to the board of an industry-owned Rural Research and Development Corporation (RDC) where that RDC requests such an appointment in order to complement existing board skills and improve dialogue with the Government. This director should not be a current Commonwealth public servant, but should have experience in, and knowledge of, government policy processes and public administration.*

*For the same purpose, the Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that the Government can, if requested to do so by a statutory RDC, select and appoint a single director to that RDC's board outside of the usual nomination process. Such a director could be, though need not be, a current Commonwealth public servant.*

*The Primary Industries and Energy Research and Development Act 1989 (Cwlth), and the statutory funding agreements for industry-owned Rural Research and Development Corporations (RDCs) should be amended so that all RDCs are required to participate in a regular, transparent and comprehensive program-wide project evaluation process, such as that currently facilitated by the Council of Rural Research and Development Corporations (CRRDC).*

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*Through the CRRDC, the RDCs should continue to explore means to increase the robustness of this evaluation process, including through:*

- examining the scope to quantify, or put orders of magnitude on, environmental and social impacts*
- including an allowance for overhead costs and implicit subsidies from publicly-funded research providers in all evaluations*
- making provision for peer review of the evaluations*
- informing future evaluations with periodic reviews of past evaluations to assess whether assumptions about adoption rates and additional extension-related costs have proved to be reliable.*

DRAFT RECOMMENDATION 8.6

*The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that statutory Rural Research and Development Corporations (RDCs) are required to commission an independent performance review at least every three years, as is currently required for industry-owned RDCs.*

*Among other things, performance reviews for both the statutory and industry-owned RDCs should explicitly examine:*

- whether there has been investment in a balanced project portfolio that includes longer-term, riskier and potentially higher-reward research, as well as short-term, low-risk, and adaptive research*
- the scientific merit of the research involved*
- whether research outcomes have been made sufficiently accessible to all levy payers and other researchers.*

*Review reports should be provided to the Minister for Agriculture, Fisheries and Forestry — along with proposed actions to address any identified performance deficiencies — and then be made publicly available.*

DRAFT RECOMMENDATION 8.7

*The Australian Government's Department of Agriculture, Fisheries and Forestry should prepare a publicly available, consolidated, annual monitoring report on the activities of the Rural Research and Development Corporations (RDCs). These monitoring reports should draw, as appropriate, on the outcomes of the program-wide project evaluation process (see draft recommendation 8.5) and independent performance reviews (see draft recommendation 8.6), and contain:*

- 
- *detailed data on each RDC's funding arrangements, including a breakdown of industry and matching government contributions, as well as the division of expenditure between R&D-related activity and any other functions*
  - *a broad overview of R&D sponsored by the RDCs and associated outcomes*
  - *details of any identified breaches of obligations under relevant legislation and associated funding agreements during the monitoring period; and the steps that have been, or will be, taken to address those breaches*
  - *a summation of the Department's performance in implementing new R&D levies, and changes to existing levies (see draft recommendation 9.3).*

#### INFORMATION REQUEST

The Commission seeks further input on what 'intermediate' sanctions could be used to address ongoing underperformance by a Rural Research and Development Corporation prior to any withdrawal of public funding for the entity concerned.

## Levy arrangements

#### DRAFT RECOMMENDATION 9.1

*Product-specific maximum levy rates should be removed from schedules 1 to 26 to the Primary Industries (Excise) Levies Act 1999 (Cwlth).*

#### INFORMATION REQUEST

The Commission seeks further input on whether R&D and marketing levies should be separate; or combined into a single industry levy, with some scope for a Rural Research and Development Corporation (see draft recommendation 8.3) to vary the allocation of funds between R&D and marketing without seeking the formal approval of levy payers.

#### DRAFT RECOMMENDATION 9.2

*The Australian Government's Department of Agriculture, Fisheries and Forestry should revise the Levy Principles and Guidelines document to ensure that the costs for an industry of seeking a change to a levy are commensurate with the magnitude of the proposed change.*

#### DRAFT RECOMMENDATION 9.3

*An indicative time limit of six months should be introduced for the implementation of new levies, and changes to the rates of existing levies,*

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*following the receipt of a complying proposal. As part of its annual monitoring report on the overall Rural Research and Development Corporation program (see draft recommendation 8.7), the Australian Government's Department of Agriculture, Fisheries and Forestry should report on its performance against this requirement, and where the requirement has not been met, indicate the reasons for this.*

DRAFT RECOMMENDATION 9.4

*The Levies Revenue Service should routinely monitor its performance and the costs of collecting levies, and promptly communicate the results of that monitoring — along with details of any proposed changes to its procedures or cost allocation protocols — to stakeholders.*

DRAFT FINDING 9.1

*R&D levies on processors should not be extended beyond their current application.*

DRAFT FINDING 9.2

*Rural Research and Development Corporations (RDCs) should continue to recognise and cater for differing regional research needs. However, RDCs should not be required to more precisely calibrate the expected regional distribution of the benefits of their project portfolios with the regional distribution of levy payments. Similarly, in determining the regional spread of their spending with research suppliers, RDCs should be cognisant of the intent of the National Primary Industries RD&E Framework.*

## **Further review**

DRAFT RECOMMENDATION 9.5

*At the end of the ten-year phase-in period for the new arrangements governing the funding and operation of the Rural Research and Development Corporations (RDCs), there should be a further independent and public review. Amongst other things, that review should examine:*

- the impact of the new arrangements on the overall level and mix of R&D sponsored by the RDCs, the rate of uptake of research outputs by primary producers, and the resulting benefits for the community*
- the extent to which the new arrangements, and especially the establishment of Rural Research Australia, have helped to increase the amount of additional, socially valuable, R&D induced by the Government's funding contribution to the RDC program*

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- *the extent to which the proposed new data collection arrangements have helped to improve the transparency of funding and spending flows within the framework*
  - *the effectiveness of the proposed new mechanism for coordinating Australian Government funding for rural R&D*
  - *the case for making industry representation a generally allowable function for any RDC*
  - *the arguments for and against continuing to provide government contributions for levies paid by processors*
  - *the effectiveness of the statutory levy rate review requirements in helping to ensure that rates remain contemporary to an industry's R&D needs*
  - *the implications of changes in the wider rural R&D framework for the RDC arrangements.*



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# 1 About the inquiry

## 1.1 The context for this inquiry

Research and development (R&D), accompanied by ‘extension’ activity to promote adoption of research outcomes, is widely regarded as essential to the productivity and competitiveness of rural producers. Indeed, the benefits from rural R&D (box 1.1) often extend beyond these producers. Consumers enjoy a range of higher quality food and fibre at lower prices. Regional communities are strengthened through new production and employment opportunities. Society as a whole gains from improved environmental and animal welfare outcomes. Some R&D is also directed at helping developing countries to address poverty and famine.

Partly in recognition of these wider benefits, the Australian and State and Territory Governments contribute significant funding for rural R&D. A key Australian Government funding program involves the 15 Rural Research and Development Corporations (RDCs), which commission R&D on behalf of primary producers and the Government. In turn, the RDCs are funded by levies on rural industries, which are matched by direct contributions from the Government (often, though not always, on a dollar-for-dollar basis).

### Box 1.1 What is ‘rural R&D’?

This inquiry focuses on R&D investments in the agriculture, fisheries and forestry industries. Consistent with the Australian and New Zealand Standard Industrial Classification system, these industries are defined as:

... mainly engaged in growing crops, raising animals, growing and harvesting timber, and harvesting fish and other animals from farms or their natural habitats. (ABS 2006, ANZSIC, Cat. no. 1292.0, p. 76)

In addition, ‘processing’ activities — such as wine production and meat processing, which are served by dedicated RDCs (chapter 2) — are also considered part of the agriculture, fisheries and forestry industries for the purpose of this inquiry.

Throughout this report, references to R&D in the agriculture, fisheries and forestry industries are collectively referred to as ‘rural R&D’.

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Although levy arrangements had existed for various industries as far back as 1900, specific R&D co-investment programs did not emerge until the 1980s, with the RDC model formally coming into effect under the *Primary Industries and Energy Research and Development Act 1989*. Since that time, and as the R&D landscape and needs of industry have evolved, various alterations have been made to the model with the aim of increasing its efficiency and effectiveness in delivering research outputs. Moreover, the policy focus for rural R&D has shifted somewhat towards areas of cross-sectoral interest and wider community benefit (for example, addressing climate change), rather than solely on increasing industry productivity and returns to primary producers.

As submissions to this inquiry demonstrate, there is remarkably strong support for the RDC model within the rural sector. However, some have questioned the continued suitability of the model in its current form. One broad concern is the degree to which public funding support complements private R&D investment by addressing unmet rural research needs, rather than simply subsidising R&D that primary producers would otherwise have had sound financial reasons to fund themselves. More specifically, participants have also raised issues relating to governance, administrative efficiency and the differences that exist in the institutional configuration of the various RDCs — in particular, between statutory RDCs (which are solely R&D focused) and industry-owned RDCs (which also perform marketing and, in some cases, industry representation functions).

## **What has the Commission been asked to do?**

The Government has asked the Commission to inquire into the RDC arrangements, examining among other things:

- the rationale for Australian Government investment in rural R&D
- the appropriateness of current funding levels and arrangements — particularly levy arrangements, and the basis for Australian Government contributions
- the effectiveness of the RDC model in enhancing the productivity and competitiveness of Australia's rural industries
- the extent to which RDC-funded projects deliver an appropriate balance between industry-specific and wider community benefits
- how the current RDC model compares and interacts with other arrangements for funding and delivering rural R&D
- the scope for improvements to the current model and any alternative models that could deliver better outcomes.



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The full terms of reference for the inquiry are reproduced at the front of this draft report.

## **1.2 The Commission's approach**

### **Promoting the interests of the whole community**

The Commission's enabling legislation requires it to 'have regard to the need to improve the overall economic performance of the economy through higher productivity in the public and private sectors in order to achieve higher living standards for all members of the Australian community' (*Productivity Commission Act 1998*, s. 8(1)(a)).

The interests of rural industries are clearly paramount in an inquiry into the RDC arrangements. The RDC model is a central feature of the rural R&D landscape and, as such, plays a leading role in promoting productivity improvements in the sector.

However, industries' interests cannot be considered in isolation from the interests of others in society. That is, the effects on the rural sector must be assessed alongside broader impacts — including for other parts of the R&D system, the environment and taxpayers. While these interests will often be aligned, ultimately, the Commission is charged with determining what policy settings would achieve the greatest benefit for the community as a whole.

### **Analysis informed by evidence**

In forming its views on the efficacy of the rural R&D framework, and the RDC arrangements especially, the Commission has drawn on both quantitative and qualitative input. However, the quantitative data available are subject to considerable limitations:

- There are major gaps in the data on how much money is currently being invested in rural R&D.
- There are many well-analysed methodological difficulties in using aggregate studies of R&D impacts to dictate policy settings. Such assessments are complicated, for example, by the often long lags between an initial investment and the realisation of returns.
  - More broadly, evidence of significant returns from *past* investments in rural R&D does not provide guidance on how much should be spent in *future*, or on whether public funding for particular programs is justified.

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- The evaluations of the benefits delivered by RDC-commissioned projects, while providing useful and more specific guidance on the RDC program, are in many respects still a ‘work in progress’.
    - They confront many of the same methodological issues as the aggregate studies.
    - Moreover, evaluations to date have tended mainly to be productivity focused, with limited quantification of environmental and social impacts.

Hence, rather than add to the plethora of empirical work already in the public domain, the Commission has used judgement and qualitative assessment to supplement the available quantitative evidence.

### **Parallel reviews and overseas experience**

The Commission’s inquiry into the RDCs is one of several inquiries and initiatives in progress, which will affect future rural R&D arrangements. Among these:

- the Rural Research and Development Council — a body created in 2009 to advise the Australian Government on rural research matters — is preparing an investment plan for the entire rural R&D sector (DAFF 2010c)
- the Australian Government, through the R&D subcommittee of the Primary Industries Ministerial Council, is working with the State and Territory Governments to develop the National Primary Industries Research, Development and Extension Framework. Among other things, this framework provides for the establishment of ‘centres of excellence’ for industry-specific and cross-industry research streams within particular States and Territories (DAFF 2010b)
- the Department of Finance and Deregulation, following a recommendation in the Blueprint for the Reform of Australian Government Administration, is examining governance arrangements for a multitude of statutory authorities and taxpayer-funded entities, including the RDCs (Advisory Group on Reform of Australian Government Administration 2010)
- the Prime Minister’s Science, Engineering and Innovation Council has established ‘expert working groups’ to address food security and the nexus between energy, carbon and water.

In formulating its proposals, the Commission has been mindful of these other reviews and reform initiatives, and has sought to avoid unnecessary duplication. That said, consistent with its terms of reference, the Commission has looked at some wider funding level issues. It has also explored a small number of specific framework issues where these have been pertinent to its assessments of the RDC

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arrangements. Where appropriate, the Commission has liaised with the aforementioned groups in the conduct of this inquiry, and will continue to do so as it progresses towards the final report.

The Commission has also examined how other countries support rural R&D and what lessons can be learned from international experiences — in particular, whether any alternative institutional structures adopted overseas might be suitable here. As part of this process, the Commission met with various interested parties in New Zealand.

### **Your input is welcomed**

In preparing this draft report, the Commission has sought input from the full spectrum of stakeholders in the rural R&D area. The inquiry was advertised nationally, including in regional print media. The Commission released an issues paper in March 2010 to identify relevant matters for inquiry participants to comment on. In response, 163 submissions were received from interested individuals and organisations.

As well, the Commission has consulted extensively with participants on a more informal basis. In addition to discussions with all 15 RDCs, meetings have been held with a broad cross-section of groups including producers, industry representative bodies, cooperative research centres, universities, private researchers, and various government departments and agencies at the Commonwealth as well as State and Territory levels. As noted above, the Commission also met with a number of parties in New Zealand. A list of all individuals, agencies and organisations consulted to date is provided in appendix A.

Importantly, this is only a draft report. The Commission now begins the process of preparing its final report, which is to be submitted to the Government by 15 February 2011. It will further refine its analysis and recommendations on the basis of additional submissions and the views provided by participants at public hearings. Details for these consultation processes can be found on p. III.

As can be observed throughout this draft report, the input provided by participants has helped considerably to inform the Commission's analysis and findings. The Commission is grateful to all who have taken the time to contribute to this inquiry, and welcomes their continued participation.

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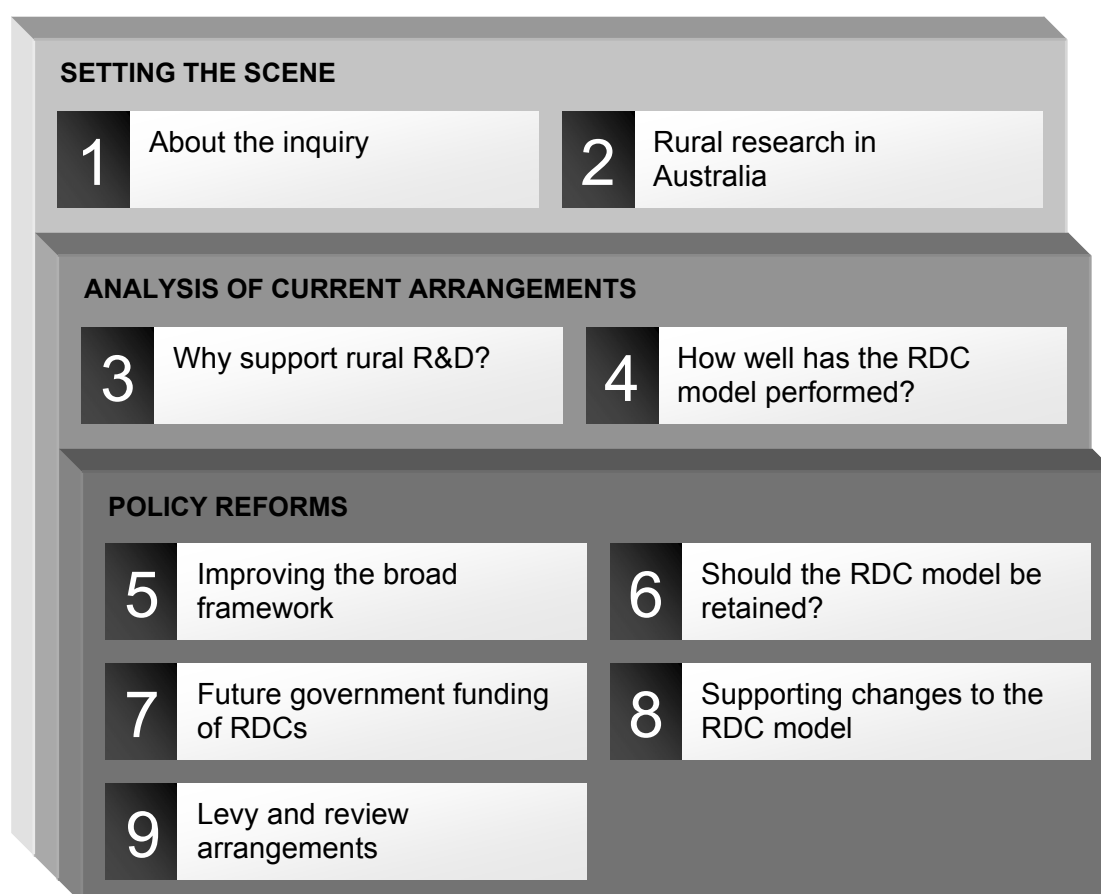
## 1.3 A ‘road map’ for the report

Figure 1.1 illustrates the structure of the draft report. Beyond this introductory chapter:

- Chapter 2 provides an overview of the rural R&D framework and the positioning of the RDC arrangements within it.
- Chapter 3 considers the benefits of investing in rural R&D and assesses various rationales for government intervention. This discussion provides the platform for the Commission’s subsequent assessments of the RDC model and broader rural R&D framework.
- Chapter 4 evaluates how well the RDC model has performed, and identifies the key factors bearing upon its suitability in the future.
- Chapter 5 discusses some potential improvements to the wider rural R&D framework that would be helpful in enhancing the outcomes from the RDC model. It also addresses the broad funding level questions raised in the terms of reference.

Figure 1.1 What the draft report covers

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- Chapters 6, 7 and 8 focus specifically on the RDC model and set out:
    - the Commission’s views on why the RDC model should be retained and modifications that should be made to its broad configuration (chapter 6)
    - proposed adjustments to the current funding arrangements for the RDCs (chapter 7)
    - potential supporting changes to the more detailed architecture of the RDC model, with a particular emphasis on future governance arrangements (chapter 8).
  - Chapter 9 considers a small number of changes to enhance the industry levy system that underpins the RDC model, as well as outlining the basis for a further review of the proposed new RDC arrangements.



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## 2 Rural research in Australia

### Key points

- The broad framework for planning, funding and delivering rural R&D in Australia is highly complex. There are multiple funders and suppliers of rural R&D, with public funding spread both across and within levels of government.
  - While this often makes it difficult to track funding and spending flows, governments appear to provide around 75 per cent of overall funds, with nearly two-thirds of the public contribution coming from the Australian Government.
- The Rural Research and Development Corporations' (RDCs) main role within this broader framework is to procure research from other institutions on behalf of industry and the Australian Government.
- The RDCs are funded primarily by industry levies and Australian Government contributions, with the latter mainly on a matching basis up to a limit of 0.5 per cent of industry gross value of production.
- The RDC governance arrangements broadly involve the translation of industry and government priorities into five year strategic plans and annual operating plans, with after-the-event annual reporting on outcomes and performance.
- Whilst the RDCs are often characterised as operating under a single model, there are considerable differences between them.
  - A key difference is between the statutory corporations, which are solely responsible for funding R&D and associated extension activities, and industry-owned corporations which also have marketing and, in some cases, industry representation functions.
  - However, there are also differences within each of these groups in regard to governance and consultation arrangements.
  - As well, there is considerable variation in the levy arrangements that provide the industry funds to each of the RDCs, with some further differences in the way that the government contribution is paid to certain RDCs.
- In 2008-09 the RDCs spent approximately \$490 million on rural R&D, representing over 30 per cent of estimated total rural R&D funding in that year.
  - The four largest RDCs accounted for a little over 60 per cent of this expenditure.
- The RDC model appears to be unique in comparison with regimes in other countries, and is seemingly highly regarded internationally.

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The Rural Research and Development Corporations (RDCs) operate within a broad institutional framework for planning, funding and delivering rural R&D. Whilst the RDCs are often characterised as operating under a single model, there are considerable differences between them. This chapter describes the rural R&D framework in Australia, and how the RDCs fit and operate within it.

## **2.1 The broad framework**

The broad framework for planning, funding and delivering rural R&D is highly complex. In particular, there are multiple funders and suppliers of rural R&D (figure 2.1). Governments are the main funders, and accordingly have the most influence over the broader framework. However, public funding is spread both across and within levels of government. Understanding the precise pattern of funding flows is further complicated by the propensity for those entities that purchase and provide R&D to supplement their primary sources of funding with cash or in-kind contributions from other sources (so called leveraging).

### **Estimates of total funding and expenditure**

The only systematic estimates of investment in rural R&D in Australia are the expenditure measures reported by the Australian Bureau of Statistics (ABS) for:

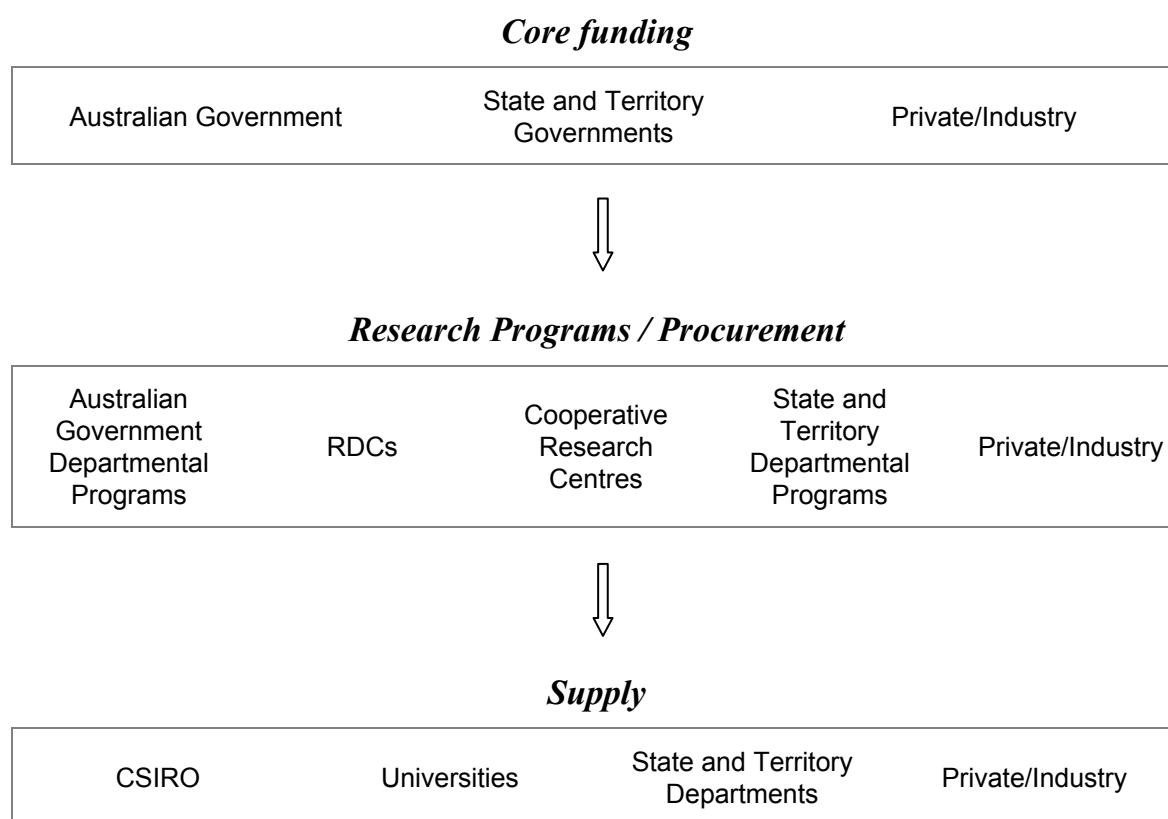
- agricultural, veterinary and environmental sciences (\$1.7 billion in 2006-07)
- plant production and primary products, and animal production and primary products (\$1.2 billion in 2006-07).

Neither of these measures match the rural R&D definition adopted in this inquiry (chapter 1). Furthermore, as expenditure measures, they provide no information on the source of funds, and may also be subject to double counting where the full cost of jointly funded R&D investments is reported as expenditure by several parties.

To estimate total rural R&D funding as defined in this report, and avoid double counting, the Commission collected data on core rural R&D funding coming from the Australian Government, State and Territory Governments and industry. These data indicate that in the order of \$1.5 billion was available to fund rural R&D in 2008-09, equivalent to about 3.3 per cent of the gross value of production (GVP) for the agriculture, fisheries and forestry sectors in that year.



Figure 2.1 Rural R&D funding and delivery framework



## Funders of rural R&D in Australia

As noted, governments are the main funders of rural R&D in Australia, with the Commission's estimates indicating that they provide around 75 per cent of total funding (table 2.1). The conventional wisdom has been that State and Territory Governments have accounted for around half of total government funding. However, the Commission's analysis of funding flows suggests this is not the case. The Australian Government is clearly a much more significant source of funds, providing nearly two-thirds of the total government funding in 2008-09.

Table 2.1 **Rural R&D funding, 2008-09**

<i>Organisation type</i>	<i>Funding</i>	<i>Share</i>
	million	%
<b>Australian Government<sup>a</sup></b>		
Cooperative Research Centres	63	
Core funding for the CSIRO	193	
Core funding for the universities <sup>b</sup>	118	
Research and Development Corporations (RDCs)	218	
Other departmental programs <sup>c</sup>	109	
Foregone tax receipts arising from R&D tax concessions	9	
<b>Total Australian Government</b>	<b>710</b>	<b>48</b>
<b>State and Territory Governments</b>		
Project-related budget allocations <sup>d</sup>	358	
Capital investment in R&D facilities	47	
Payments to other funders and suppliers <sup>e</sup>	19	
<b>Total State and Territory Governments</b>	<b>424</b>	<b>28</b>
<b>Private/Industry</b>		
Levy payments provided to RDCs	248	
Other (for which a tax concession is claimed) <sup>f</sup>	115	
<b>Total Private/Industry</b>	<b>363</b>	<b>24</b>
<b>Total</b>	<b>1497</b>	<b>100</b>

<sup>a</sup> Only the portion of the budget assigned to rural R&D is included. <sup>b</sup> Estimated by applying the rural share of total university funding received from contestable sources and the portion of university students studying in agriculture related areas to the three largest university block grants. <sup>c</sup> Includes programs aimed at wider issues (such as climate change), programs with no sector-specific focus and any one-off payments. <sup>d</sup> Includes rural R&D and associated extension funding for programs facilitated within the primary industry department (or its equivalent). <sup>e</sup> Includes payments to Forestry Tasmania, BSES Limited, Cooperative Research Centres and other research providers. <sup>f</sup> Calculated using tax concession data (including an estimate for concessions claimed for R&D on agricultural chemicals).

Source: Productivity Commission estimates.

### *Australian Government programs*

The Australian Government has a range of programs, spread across several departments, which provide funding for rural R&D. These programs are positioned within a set of national and supplementary rural R&D priorities (box 2.1).

- The largest of these programs is the RDC program, administered by the Department of Agriculture, Fisheries and Forestry (DAFF). As described in detail in section 2.2, it is a co-investment model whereby the RDCs procure rural R&D using funds collected from primary producers via statutory or voluntary

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levies, and provided by the Government generally on a matching basis up to a cap.

- The Cooperative Research Centres (CRCs) are partnerships between different research funders, suppliers and end users, formed to undertake R&D in specific areas, with a particular emphasis on applied R&D. CRCs must include a university and an end user, with other possible partners including an RDC, CSIRO, industry representative or government organisation. CRCs receive public funding, which must be matched by participants' cash and in-kind contributions, for a period of up to 10 years via a competitive merit-based selection process (CRC Association 2010). There are currently 11 rural-related CRCs (box 2.2).

#### **Box 2.1      National and rural R&D priorities**

The National Research Priorities were established in 2002 to guide all publicly funded research. The Rural R&D Priorities, which relate specifically to agriculture and food, supplement the National Research Priorities.

<b>National Research Priority</b>	<b>Corresponding Rural R&amp;D Priorities</b>
<i>Promoting and Maintaining Good Health</i>	<i>Productivity and Adding Value</i> Improve the productivity and profitability of existing industries and support the development of new ones <i>Supply Chain and Markets</i> Better understand and respond to domestic and international market and consumer requirements and improve the flow of such information through the whole supply chain, including to consumers
<i>An Environmentally Sustainable Australia</i>	<i>Natural Resource Management</i> Support effective management of Australia's natural resources to ensure primary industries are both economically and environmentally sustainable <i>Climate Variability and Climate Change</i> Build resilience to climate variability and adapt to and mitigate the effects of climate change
<i>Safeguarding Australia</i>	<i>Biosecurity</i> Protect Australia's community, primary industries and environment from biosecurity threats

Source: DAFF (2007).

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### Box 2.2      **More on the CRC model**

As noted in the text, there are currently 11 rural CRCs, which are due to expire between 2012 and 2017 (see below). Most are of seven years duration, which until an increase to 10 years in 2008, was the maximum term.

As well as increasing the maximum funding period, the 2008 changes to the CRC requirements will also make it more difficult to extend a CRC. It has always been a requirement that for Government funding to be renewed after the initial term, the research focus must change. However, now the aggregate duration for a CRC can only exceed 15 years under 'exceptional circumstances'. This, coupled with the fact that many of the rural CRCs are in their second or third terms, has lead some participants to conclude that there will be fewer rural CRCs in the future.

Australian Seafood	2014
Beef Genetic Technologies	2012
Cotton Catchment Communities	2012
Dairy Futures	2016
Forestry	2012
Future Farm Industries	2014
Internationally Competitive Pork	2012
Invasive Animals	2012
National Plant Biosecurity	2012
Poultry	2017
Sheep Industry Innovation	2014

*Sources:* CRC Association (2010); DIISR (2010b).

- The Australian Government also funds rural R&D through a range of other programs. While some of these programs are industry-specific (such as the Fisheries Resources Research Fund), most are general. Some target issues of direct relevance to the wider rural sector (for example, the Climate Change Research Program). In other cases, there is no sector-specific focus, but the rural sector may nonetheless receive some funding support (for instance, the Commercial Ready program and the R&D tax concession).

A list of Australian Government programs that provide funding for research in the rural sector is set out in box 2.3.

## Box 2.3 Australian Government programs providing funding for rural R&D<sup>a</sup>

Portfolio <sup>b</sup>	Program
<i>Agriculture, Fisheries and Forestry<sup>c</sup></i>	Caring for our Country Climate Change Research Climate Change Research Strategy for Primary Industries Fisheries Research Fisheries Resources Research Fund Forest Industries Climate Change Research Fund Managing Climate Variability National Weeds and Productivity Research and Development Corporations Regional Food Producers Innovation and Productivity
<i>Environment, Water, Heritage and the Arts</i>	National Environmental Research <sup>d</sup> Sustainable Rural Water Use and Infrastructure
<i>Climate Change</i>	Australian Climate Change Science Bilateral Climate Change Partnerships
<i>Innovation, Industry, Science and Research</i>	ARC grants Climate Ready <sup>e</sup> Commercialisation Australia Commercialising Emerging Technologies Cooperative Research Centres CSIRO block funding Super Science Initiative National Collaborative Research Infrastructure Strategy North West and Northern Tasmania Innovation Fund R&D Tax Concession R&D Tax Offset University block funding <sup>f</sup>

<sup>a</sup> The Department of Foreign Affairs and Trade also provides funding to Australian entities to perform R&D related to Australian aid programs. Some programs, such as the Managing Climate Variability program and Climate Change Research Strategy for Primary Industries, are collaborative initiatives which attract investment from sources other than the Australian Government. <sup>b</sup> At the time of writing. <sup>c</sup> Other programs that were until very recently funded through the Agriculture, Fisheries and Forestry portfolio were the Advancing Agricultural Industries program and National Resource Innovation Grants. DAFF is no longer providing funding for the Climate Change Research Strategy for Primary Industries and the Fisheries Research Program. DAFF does not provide direct funding to the Managing Climate Variability Program. <sup>d</sup> The National Environmental Research Program was previously the Commonwealth Environment Research Facilities. <sup>e</sup> Closed for applications. <sup>f</sup> The Education, Employment and Workplace Relations portfolio also funds universities via schemes that support capital development and education provision in higher education institutions.

## State and Territory Governments

As noted earlier, the significance of State and Territory Government funding for rural R&D appears to have been overstated. One reason for this may be that funding and expenditure have been conflated, meaning that investment that has come from

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other parties — and in particular the Australian Government — has been taken to be State and Territory Government funding.

Nonetheless, the State and Territory Governments continue to provide a significant quantum of funding for rural R&D, much of it directed at in-house research conducted in State and Territory research institutes and experimental stations (see below) and related extension activities. In addition, State and Territory Governments contribute some funding (or in-kind contributions) to the CRCs and RDCs.

The conflation of funding and expenditure figures also complicates assessment of the contention that State and Territory Government funding for rural R&D has been declining.<sup>1</sup> As discussed in chapter 5, many participants expressed concern about what they perceived to be a progressive withdrawal of State and Territory Governments from the rural R&D area. There certainly appear to have been declines in some jurisdictions — motivated by both budgetary pressures and a perception that private parties should be shouldering more responsibility for funding extension activity. However, the Commission does not have evidence that all States and Territories have reduced their total funding support.

### *Private funders*

There are three main sources of private funding for rural R&D in Australia.

- Industry levy payments for the RDCs, industry-owned research institutions such as BSES Limited — an entity that performs some \$20 million a year of sugar research — and state-based research organisations such as the South Australian Grains Industry Trust and the (WA) Agriculture Produce Commission.
- Large commercial farming companies such as Auscott Limited, Clyde Agriculture, Huon Aquaculture, PrimeAg and Twynam.
- Chemical and fertiliser research companies such as BASF, Bayer, Dow, Monsanto, Nufarm, Pfizer and Syngenta, which also make large investments in rural R&D internationally.

As noted earlier, collectively private entities appear to fund around 25 per cent of overall rural R&D — a share which is low by international standards (section 2.4). However, it is important to recognise that the share of private funding varies considerably across industry sectors. For example, in the sugar industry, private

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<sup>1</sup> For example, ABS data (*Research and Experimental Development*, Cat. 8112.0) do not show a substantial downward trend in total State and Territory Government expenditure on rural R&D.

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parties have provided the majority of R&D funding for many years (BSES Limited, sub. 42; SRDC, sub. 140).

## **Providers of rural R&D in Australia**

The four main rural R&D suppliers in Australia are the State and Territory Governments, CSIRO, universities and private providers.

### *State and Territory Government research facilities*

State and Territory primary industry departments operate a geographically dispersed network of experimental stations and extension services close to local producers. However, partly because of the large capital cost of refurbishing outdated infrastructure, this network has apparently been contracting. The National Primary Industries Research, Development and Extension (RD&E) Framework initiative (see below) is likely to lead to both further rationalisation of the network and much greater specialisation in research across the jurisdictions.

### *CSIRO*

The CSIRO is the largest supplier of rural R&D in Australia. About 60 per cent of CSIRO's funding for agriculture- and food-related R&D comes from Commonwealth block grants, with the remainder from contestable sources (of which around a quarter is from the RDCs). In 2009-10 CSIRO had an agriculture and food R&D budget of \$315 million. This represented about 30 per cent of CSIRO's total expenditure on R&D.

### *Universities*

The universities, along with CSIRO, have historically been the main providers of basic rural research, seeking to add to the knowledge base, rather than targeting specific applications. However, in the past 20 years, through increased partnerships with the RDCs and CRCs, universities are conducting more project-focused, applied research. Some partnership arrangements are made more attractive by top-up infrastructure funding from the Australian Government when partnering occurs. As discussed in chapter 5, this may allow those entities procuring R&D from the universities to shift costs back to the Australian Government.

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### *Private providers*

Private supply of rural R&D takes two broad forms.

- Some rural industries are served by industry-owned providers. For example, BSES Limited and the Australian Wine Research Institute receive funds from their respective industries, either directly via levy payments and/or indirectly from the relevant RDC.
- As well as procuring research from other suppliers, large farming operations and multinational chemical and fertiliser companies also conduct rural R&D in-house. However, as an in-house activity, relatively little information is available on the total amount of research conducted on this basis in Australia.

### **Extension arrangements**

Broadly, extension is the process of enabling end users to apply the outcomes of R&D. Extension can take various forms, from the dissemination of general information on new technologies, to more specific ‘how to’ sessions for groups of primary producers, through to one-on-one services tailored to an individual producer’s particular circumstances.

Historically, extension services in rural industries were mainly provided by State and Territory Government agricultural departments, often on a producer-specific basis, with some work also undertaken by CSIRO. However, the way in which rural extension is delivered and funded in Australia has been changing in recent years.

- In response to reduced direct provision of extension services by State and Territory Governments, in some industries there has been an increase in the number of private agronomists providing these services.
- As well, grower groups have become increasingly involved in disseminating research results. Kondinin Group and Birchip Cropping Group are two notable examples.
- In some industries, RDCs have taken on the extension role formerly provided by State and Territory Governments (chapter 4).
- There is sometimes joint public and private investment in extension programs. For example, the Victorian Department of Primary Industries, in partnership with Dairy Australia, established the Dairy Extension Centre. Also, the Grain and Graze program, which included funding for extension, was a joint initiative between a number of RDCs, farmer and Landcare groups, research providers and regional management authorities.



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- There has been an increased emphasis on extension in Australian Government programs in areas such as conservation and sustainability. For example, the Fitzroy Basin Association (via the Caring for our Country program) provides training and technical support to landholders on monitoring, managing and improving land and water quality. Also, the National Adaptation and Mitigation Initiative, a joint investment between DAFF's Climate Change Research Program and the Grains RDC (GRDC), aims to demonstrate climate variability adaptation measures on-farm.

Synthesising the growing diversity and complexity of extension arrangements in Australia, DAFF observed that:

While in each industry extension operates differently, extension is now a maze of different providers and access points, through private consultants, agribusiness and input suppliers, local grower groups, and public information obtained through the internet, conferences, demonstrations, workshops and publications. The result is a set of complex communication and delivery channels through which information, knowledge, new learning and ideas flow both ways. (sub. 156, p. 36)

## **Initiatives to enhance the framework**

### *The National Primary Industries RD&E Framework*

The Primary Industries Ministerial Council and Primary Industries Standing Committee R&D subcommittee,<sup>2</sup> in conjunction with the RDCs, are currently overseeing the development and implementation of the National Primary Industries RD&E Framework. The framework is intended to:

- provide strategic direction and priorities for both industry-level and cross-sectoral rural R&D
- reduce fragmentation and gaps in R&D infrastructure, including through creating centres of excellence within particular States and Territories. In most cases, this will result in the R&D for specific industries being concentrated in only a few jurisdictions. (Under the framework, the CSIRO is considered to be a jurisdiction for this purpose.)

Whilst this effort will rationalise R&D supply and thus offer the prospect of cost savings, the Commission understands the aim is not to reduce total government

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<sup>2</sup> The Primary Industries Standing Committee comprises the Department Heads and CEOs of the Australian, State, Territory and New Zealand Government agencies responsible for rural-related industries. The R&D subcommittee comprises representatives from Australian, State and Territory Governments, the CSIRO, Grains RDC, Rural Industries RDC and the Australian Council of Deans of Agriculture.

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funding for, and spending on, rural R&D. Rather, the aim is to spend existing funds more effectively. However, this has been disputed by some inquiry participants who saw the initiative as a means for State and Territory Governments to further reduce their funding for rural R&D. (See, for example, Australian Institute of Agricultural Science and Technology, sub. 12.)

### *The National Rural R&D Investment Plan*

The Rural R&D Council was established in 2009 to provide the Minister for Agriculture, Fisheries and Forestry with advice on public investment in rural R&D. To this end, the council is developing a National Rural R&D Investment Plan. This plan, expected to be released this year, will focus on the wider rural R&D framework and its interaction with other areas of government R&D investment. Additionally, the council has been charged with establishing a performance measurement and reporting framework against an agreed list of national priorities and key performance indicators.

## **2.2 The RDC model**

### **Precursors to the current regime**

The early rural R&D levy regimes were initiated by producers. The first of these, a state-based levy for funding the Bureau of Sugar Experiment Stations, was a compulsory scheme in place between 1900 and 1997 (BSES Limited, sub. 42). However, most of these early regimes, such as the Pastoral Research Trust and Wheatgrowers' Soil Fertility Research Fund, were funded by voluntary contributions from producers, and as such were subject to various 'free-rider' problems (chapter 3).

Accordingly, at the request of the wool industry, the Australian Government established a compulsory producer levy for funding wool promotion and research in 1936. The wool industry model evolved over 20 years (box 2.4) into a system whereby the Government matched the industry's levy contributions and a statutory advisory committee administered the funds. This model remained in place until the mid-1980s, during which time similar schemes were introduced in other rural industries.

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#### **Box 2.4      Evolution of the wool industry model**

Following the establishment of a compulsory levy in 1936, government matching contributions were introduced in 1945 for wool research on a one-for-one basis. This coincided with the transfer of control of the research account from the Australian Wool Board to a committee of four government departments. In 1953, control of the funds was transferred back to the Board, but with input on funding decisions from a mandatory government Board member. In 1957, a statutory advisory committee, comprising representatives from the Department of Primary Industry, the CSIRO and producer groups, was given the power to administer the funds. Funding decisions were made by the Minister on the basis of the committee's recommendations. This scheme remained in place for the next 28 years.

*Source:* Price (2002).

In the early 1980s, concerns about the committees administering rural R&D funds emerged — particularly the failure of these committees to consider expected rates of return when allocating funds to projects (Public Service Board 1983). More generally, the Government considered that the committees needed to focus more on conducting research in high priority areas.

The *Rural Industries Research Act 1985* (Cwlth) reformed the operating environment for RDCs. In particular, the Act replaced the individual research committees with 14 industry research councils. These councils allocated funds among research suppliers on behalf of specific commodity groups. Unlike the committees they replaced, the councils were accountable to the Australian Government for the expenditure of matching contributions. Additionally, the Act established uniform funding arrangements across most industries.

Despite these changes, concerns persisted about how rural R&D funds were being administered — including a perceived lack of co-ordination and communication between the various councils, and lack of clarity in their decision making processes. Additionally, the Government considered that the councils needed to develop both greater links with industry and a commercial viability (Kerin and Cook 1989).

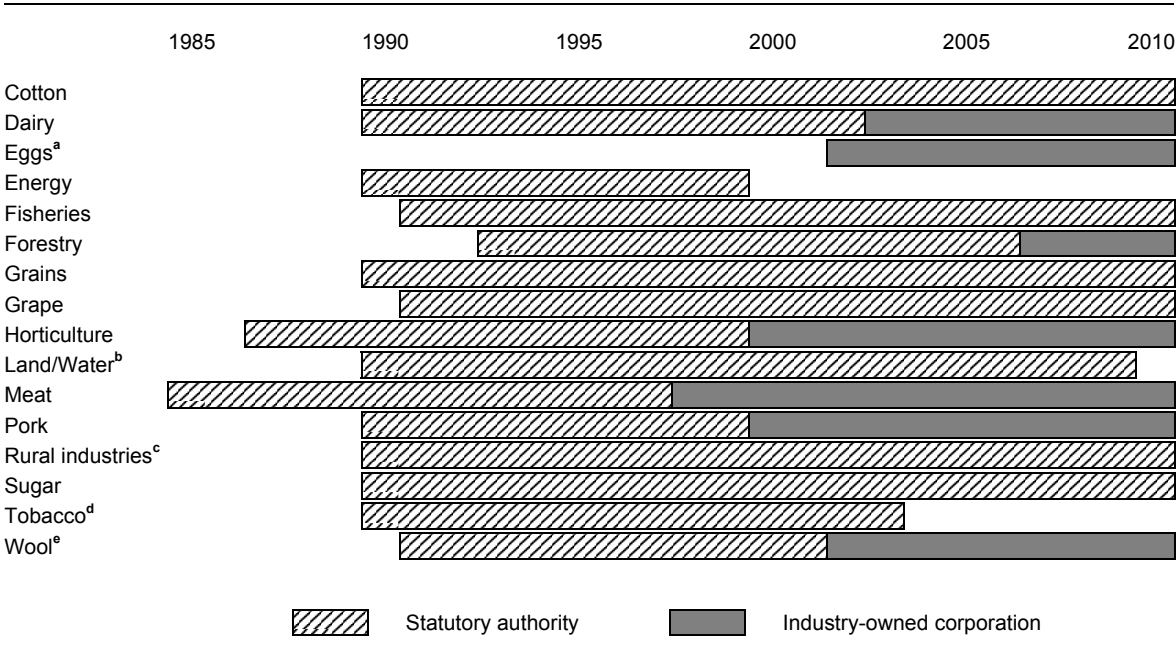
To help address these concerns, the *Primary Industries and Energy Research and Development Act 1989* (Cwlth) (the PIERD Act) established the current statutory model for the RDCs. This saw the replacement of the industry research councils with the RDCs, while maintaining the previous funding arrangements. (R&D corporations had already been established in the meat and horticulture industries in 1985 and 1987, respectively.) The corporation model was premised on the need to give the RDCs operating and financial flexibility and increase the efficiency with which R&D funds were spent. More generally, the RDC model was designed to

better reveal industries’ research priorities, avoiding a reliance on researchers to set the agenda, as was perceived to have occurred under the previous model (Kerin 2010).

### Evolution of the current model

Since the introduction of the PIERD Act, several new RDCs have emerged, whilst some others have ceased operations — namely, two cross-sectoral RDCs, Land and Water Australia (LWA) and the Energy RDC in 2009 and 1999 respectively, and the Tobacco RDC in 2003 (figure 2.2).

Figure 2.2 R&D corporation timeline, by industry



<sup>a</sup> Egg R&D was procured through the Rural Industries RDC from 1990 to 2002. <sup>b</sup> Land and Water Australia. <sup>c</sup> Rural Industries RDC. <sup>d</sup> Horticulture Australia Limited administered tobacco R&D from the time the Tobacco RDC was terminated until 2007. <sup>e</sup> The Australian Wool Corporation operated from 1973 to 1991.

Also, aspects of the arrangements governing the operations of the RDCs have changed significantly. A number of these changes reflect the characteristics of the particular industries concerned, including agri-political factors. However, the most fundamental changes have come through the transformation of many of the original statutory authorities into industry-owned corporations (IOCs), operating under the *Corporations Act 2001* (Cwlth). Thus, there is now variation in the legislative underpinnings of the RDCs (box 2.5). The impetus for the creation of IOCs — which provide services additional to R&D (see below) — came from a desire by some industries to integrate separate R&D and marketing bodies.

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### Box 2.5      **RDC legislative underpinnings**

As well as the legislation relating to the imposition, collection and disbursement of industry levies, the RDCs' activities are underpinned by various 'core' legislation.

The PIERD Act enables the establishment of the statutory RDCs and also formally establishes the Rural Industries RDC. All other statutory RDCs are formally created under PIERD Act regulations. The *Commonwealth Authorities and Companies Act 1997* (Cwlth) regulates certain aspects of the statutory RDCs' financial affairs.

The industry-owned corporations are each established under industry-specific legislation (for example, Australian Pork Limited is established under the *Pig Industry Act 2001* (Cwlth)). These Acts also enable levy payments and matching contributions to be transferred to the IOC. The terms and conditions attached to these payments are set out within a statutory funding agreement with the Australian Government (see below). As noted in the text, these bodies are also subject to the *Corporations Act 2001* (Cwlth).

Sources: IOC constitutions; DoFD (2009).

Today there are 15 RDCs, of which a majority (nine) are IOCs. All except one of the RDCs cover particular industry sectors, such as fisheries and grains. The exception is the Rural Industries RDC (RIRDC), which covers a variety of diverse, smaller industries, as well as sponsoring research on national rural issues. To varying extents the other RDCs also invest in R&D that targets issues with relevance beyond their levy paying constituency (see below).

### **Key features of the RDC 'model'**

In the sense that all of the RDCs are involved in procuring research on behalf of industry and the Government, and facilitating the dissemination, adoption and commercialisation of research results, the arrangements can be broadly characterised as a model.

However, in giving effect to this broad functional role, there is considerable variation across the RDCs in their research focus, involvement in non-R&D activities, and funding and governance arrangements. To a considerable extent, this likely reflects the diversity of Australia's rural industries. As Across Agriculture observed:

... businesses in the Australian rural sector are not homogeneous in terms of scale, demography, enterprise mix and the geographic and climatic conditions under which they operate. It is also evident that businesses in the sector experience constant change, driven by a range of climatic and market factors. A consequence of this is that there cannot be a one-size-fits-all policy model available that can be applied across the entire rural sector with respect to research and development policy or structures. (sub. 116, p. 25)

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## *Funding*

Like its predecessor arrangements, the RDC model is a co-investment model. Hence, most of the RDCs' funds come via industry contributions and direct payments from the Australian Government. Other sources of revenue include royalties, funding from other government R&D programs (where the RDC is procuring research of relevance to those programs), and other RDCs (where research is sponsored on a collaborative basis).

### *Industry contributions*

The RDCs receive industry contributions from both statutory levies on producers (and in some cases processors, and in one case importers), and voluntary payments. Whilst statutory levies are compulsory, levy payers can vote to have the rate set to zero, effectively removing the levy. DAFF collects statutory levies on behalf of the RDCs, charging a collection fee for this service. Levies are set on a range of different bases — though in most cases related to units of inputs or outputs rather than linked to value. (More details on the levy arrangements, including the generally lengthy procedures for introducing or changing a levy, are provided in chapter 9.)

Most industries have voted to set levy rates that generate revenue close to the Government's matching contribution cap (see below). However, in the grains and wool industries as well as some smaller industries within the RIRDC umbrella, levy payments exceed the contribution cap.

### *Government contributions*

In most cases, the Government matches industry levies on a one-for-one basis up to 0.5 per cent of industry GVP. This limit is calculated using a three year rolling average of GVP, so in practice, government contributions can exceed industry levies in any given year. The rolling average formula is used to dampen fluctuations in funding resulting from volatility in industry output levels and hence levy payments.<sup>3</sup> Additionally, the Fisheries RDC (FRDC) and RIRDC receive some unmatched contributions from the Government for 'public good' research (box 2.6).

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<sup>3</sup> The matching contribution is paid on acquitted R&D expenditure, rather than levy revenue per se, and can also be adjusted to take account of previously unmatched R&D expenditure. In addition, cumulative Government contributions (that is, the total matching contributions received by an RDC over the duration of its operations) cannot exceed cumulative industry contributions (though this cap does not apply to RIRDC). However, for all intents and purposes, the 0.5 per cent of GVP cap is usually the binding limit.

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### Box 2.6 **FRDC and RIRDC Government funding arrangements**

The Government funds FRDC by:

- matching producer contributions up to 0.25 per cent of GVP
- providing unmatched funds equivalent to 0.5 per cent of GVP.

The unmatched funding component is provided to help fund research that supports the stewardship role of the Australian Government in relation to fisheries resources on behalf of the Australian community.

The Government funds RIRDC through:

- matching producer contributions made by industries within the RIRDC umbrella that pay a statutory levy, up to 0.5 per cent of industry GVP
- an annual general appropriation of \$10 million (in 2010-11).

RIRDC's general appropriation, reduced from \$13 million in 2008-09, is for investment in new rural industries and national rural issues. RIRDC uses some of these funds to match the voluntary contributions (up to a cap of \$300 000 per industry) made by those industries without a statutory levy in place.

*Sources:* FRDC (2009); RIRDC, pers. comm., 29 June 2010.

The IOCs receive industry levies and matching contributions via a Statutory Funding Agreement (SFA) with the Government (box 2.7). These agreements, which differ slightly according to the particular circumstances of individual IOCs, require the entities concerned to use funds transparently and comply with various reporting and planning requirements (see below).

### *Governance*

Broadly, the RDC governance arrangements involve the translation of industry and government research priorities into five year strategic plans and annual operating plans, with after-the-event reporting on outcomes and performance. As part of this governance regime, there are various formal and informal consultation processes through which the Government and industry can have input into the R&D portfolios pursued by the RDCs.

### *Boards*

RDCs are governed by boards of directors who are, generally, nominated by independent selection committees (see chapter 8). The PIERD Act requires that statutory RDC board members be appointed by the Minister for Agriculture,

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### Box 2.7      **Statutory Funding Agreements**

SFAs support the relevant pieces of industry legislation that allow IOCs to receive statutory levies and matching funds. SFAs are usually updated when they expire, taking account of the performance of the particular IOC and any changes in the Government's policies and priorities.

The most recent major review of the SFA accountability framework as a whole was in 2004. At that time, key changes made to the SFA arrangements were the:

- introduction of a 'sunset' clause requiring renegotiation of the SFA to take account of the latest independent performance review
- extension of the definition of agri-political activities (which cannot be funded by levy payments or matching contributions) to include board election campaigns
- introduction of a requirement for each IOC chair and CEO to report annually to the Minister on their compliance with the SFA
- introduction of a requirement for an IOC to consider and report on the contributions of its activities to the national and rural R&D priorities.

Since 2010, new SFAs are being updated to:

- better promote the Government's priorities, including with regard to:
  - participation in the National Primary Industries RD&E Framework
  - collaboration with other RDCs
- better meet the Minister's expectations on how funds should be spent and to facilitate Ministerial intervention and direction to ensure funds are expended for their intended purpose
- enhance evaluation of projects
- facilitate best practice board corporate governance.

*Source:* DAFF (2010c).

Fisheries and Forestry. In contrast, IOC directors are elected by their company's members (box 2.8) in keeping with corporations law. In both cases, however, the Managing Director or CEO is appointed by the board. Prior to 2006, there was a requirement that a designated 'government director' — often a public servant — sit on the board of the statutory RDCs. However, following the 2003 Uhrig review into the corporate governance of statutory authorities, this requirement was removed.

That said, a government representative sometimes attends the board meetings of some RDCs as an observer.



### Box 2.8 Membership of IOCs

IOC levy payers can generally opt to become members of their particular RDC. This entitles them to voting rights (usually in proportion to levy payments made) on matters such as board membership. Horticulture Australia Limited is the only IOC without producer members. Instead, the peak industry bodies constitute the membership, holding voting rights in proportion to the amount of levy collected from their respective producers.

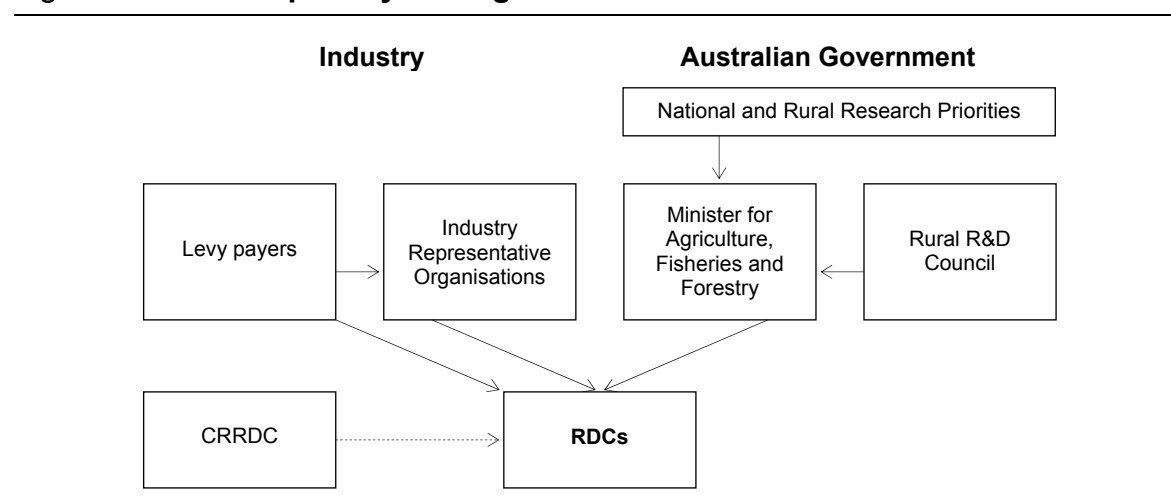
Source: IOC constitutions.

### *Priority setting*

There are various channels through which industry and the Australian Government provide input into the RDCs' priorities (figure 2.3). Also, the Council of Rural Research and Development Corporations (CRRDC) provides an opportunity for the RDCs to collaborate on their respective strategic directions (see below).

All RDCs must produce five year strategic plans detailing how industry and government priorities will be met, and an annual operational plan specifying the general categories of R&D activities which will be funded that year, likely administrative expenses and expected receipts. Whilst all RDCs are required to make available their strategic and operating plans to industry and the Government, only the statutory authorities must have these documents formally approved by the Minister.

Figure 2.3 RDC priority setting framework



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The Australian Government's main guidance in regard to RDCs' research focus comes via the national and rural research priorities (box 2.2). However, these priorities are very broad, and intentionally leave the RDCs with considerable autonomy in the selection of projects. DAFF has periodic meetings with the RDCs (either via the CRRDC, or on an individual basis), which can provide an opportunity to clarify and reinforce Government priorities. However, in discussions, some RDCs indicated that, in practice, such meetings have not always been particularly helpful in this regard.

The formal arrangements relating to consultation with industry in the development of five year plans vary between the statutory RDCs and the IOCs. The statutory RDCs must consult with nominated industry representative organisations on the development of research priorities, whereas for the IOCs there is simply a requirement in their respective SFAs to consult with industry representatives and/or levy payers. In practice, however, this difference is more apparent than real. The statutory RDCs are not limited to consulting only with the prescribed bodies and typically engage with a wide cross-section of industry interests. Also, requirements to consult with particular peak bodies are written into the constitutions of some IOCs.

The RDCs use a variety of methods to consult with industry representatives and, in some cases, directly with producers. Much communication and feedback is facilitated via state conferences, newsletters and surveys. However, some RDCs have established dedicated regional forums to elicit stakeholder input (chapter 4), and others are required to conduct regular industry polls to determine levy rates (chapter 9).

Moreover, while the emphasis of consultation is mainly on primary producers and their representatives, some RDCs also elicit feedback from other parts of the value chain, such as processors.

### *Reporting and Evaluation*

While all of the RDCs are subject to some general performance monitoring, these arrangements differ for the statutory corporations and IOCs.

- The PIERD Act requires the statutory authorities to provide the Minister and industry representative organisations with an annual report detailing, among other things, an assessment of the extent to which their operations have contributed to the strategic and annual operational plans. These reports are tabled in parliament. Additionally, the statutory RDCs are subject to the accountability

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and reporting requirements specified in the *Commonwealth Authorities and Companies Act 1997* (Cwlth).

- IOCs are required to report annually to the Minister on their compliance with the SFA and must also have their performance periodically reviewed by independent consultants. These requirements are on top of the annual reporting obligations specified in the Corporations Act. However, only the annual reports, compliance reports and SFAs of Dairy Australia and the Australian Livestock Export Corporation must be tabled in parliament.

In meeting their reporting requirements, some of the RDCs (such as GRDC, RIRDC and previously LWA), have a long history of formal ex post project evaluation. For other RDCs, such evaluation is a more recent development under the auspices of the evaluation program initiated by the CRRDC in 2007. This effort, developed in consultation with ACIL Tasman, seeks to determine the impact of RDC investments by analysing a random sample of projects each year (see chapter 8).

### *Collaboration*

The need for the RDCs to engage with multiple stakeholders and their role in mobilising funding from several sources means that they are inherently collaborative entities. Thus, DAFF (sub. 156, p. 45) observed:

As investors in R&D, it is the fundamental role of the RDCs to collaborate with research providers and other funders in order for research to be done.

The CRRDC (sub. 128) reported that 80 per cent of the RD&E investments by the RDCs involve some financial or in-kind contribution from other parties, including other RDCs (table 2.2).

Collaboration between the RDCs occurs on both an informal basis and in meeting legislative requirements.

- Informal initiatives mostly involve engagement between RDCs on particular projects and programs (see chapter 4).
- The PIERD Act requirement that the RDCs meet at least annually to coordinate R&D activities is fulfilled by the CRRDC. While the IOCs are not formally required to attend these meetings, all are usually present. The CRRDC now has an independent chair and a full time secretariat, and is currently performing a coordinating role in regard to matters such as evaluation and improving the administrative efficiency of RDC activities (CRRDC, sub. 128).

**Table 2.2 RDC collaborative RD&E investments, 2009-10**

<i>RDC</i>	<i>Collaborative investments</i>	<i>Non-collaborative investments</i>
	%	%
Australian Egg Corporation Limited	56	44
Australian Livestock Export Corp.	100	0
Australian Meat Processor Corp.	99	1
Australian Pork Limited	93	7
Australian Wool Innovation	89	11
Cotton RDC	88	12
Dairy Australia	98	2
Fisheries RDC	95	5
Forest and Wood Products Australia	70	30
Grains RDC	90	10
Grape and Wine RDC	55	45
Horticulture Australia Limited	71	29
Meat and Livestock Australia	51	49
Rural Industries RDC	98	2
Sugar RDC	98	2
<b>Weighted average</b>	<b>80</b>	<b>20</b>

Source: CRRDC, sub. 128.

The RDCs also collaborate, to varying degrees, with:

- R&D providers seeking cash funding, such as the universities
- partners involved in research funded through other Australian Government programs
- other funders of R&D, such as the Australian Centre for International Agricultural Research
- international rural R&D organisations. For example, Dairy Australia has Memorandums of Understanding with rural research providers in Europe and New Zealand; and MLA, GRDC and Horticulture Australia Limited have also participated in some joint funding agreements with international research entities.

Through such collaboration, and their involvement in processes such as the National Primary Industries RD&E Framework initiative, the RDCs are widely seen as having a much more significant role within the rural R&D framework than their direct funding would indicate. That said, concerns remain about the extent and focus of their collaborative activities (see chapter 4).

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### *Other activities*

As noted, as well as procuring R&D, the IOCs provide marketing services to members, funded (in most cases) by separate levies on producers.

In addition, Australian Pork Limited and the Australian Egg Corporation Limited perform an industry representation role for their respective industries. For Australian Pork Limited, this role is formally defined in the industry legislation, while the Australian Egg Corporation Limited fulfils this function via a default clause in its legislation and SFA. Further, the *Dairy Produce Act 1986* (Cwlth) includes ‘strategic policy development’ among Dairy Australia’s approved activities.

To differing degrees, all of the RDCs also provide extension services related to their research activities. This may variously involve engagement with extension groups, the conduct of workshops, funding for demonstration farms and dissemination of research publications.

Some RDCs also invest in education. For example, several of the RDCs directly fund post-graduate scholarship programs, while Dairy Australia jointly funds the National Centre for Dairy Education Australia. The Cotton RDC indirectly invests in education via its funding for the Cotton Catchment Communities CRC. Also, some of the RDCs fund rural R&D-related conferences and seminars (CRRDC, sub. 128).

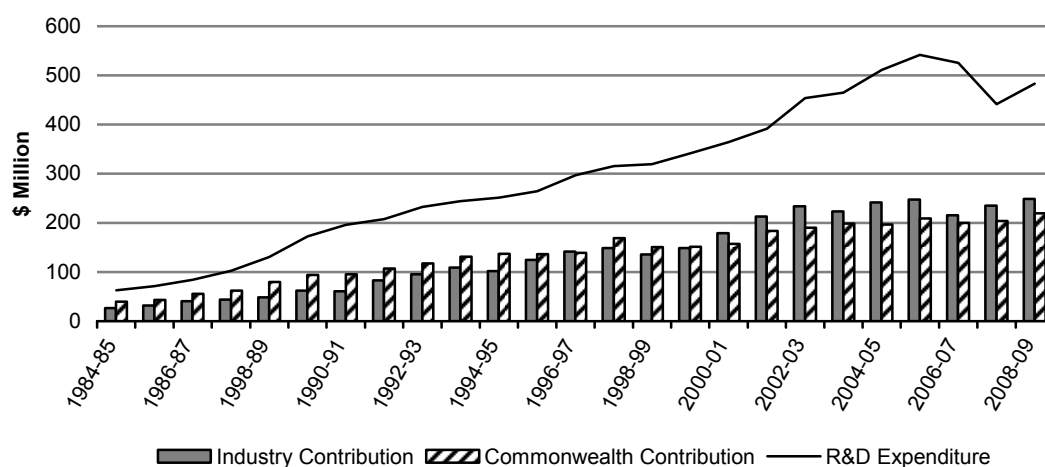
## **2.3 Recent RDC activity**

### **Overall funding levels**

Over the past decade, the RDCs have funded more than \$4 billion worth of R&D projects, with expenditure in 2008-09 being around \$490 million (figure 2.4).

Expenditure levels vary considerably across the individual RDCs (table 2.3). The four largest RDCs (GRDC, Horticulture Australia Limited, MLA and Australian Wool Innovation) accounted for more than 60 per cent of R&D expenditure across the program as a whole in 2008-09. At the other end of the spectrum, the Australian Livestock Export Corporation and the Australian Egg Corporation Limited spent about \$0.8 million and \$2 million, respectively. Similarly, marketing expenditure varies significantly across the IOCs, though not necessarily in proportion to R&D expenditure.

**Figure 2.4 RDC contributions and estimated R&D expenditure<sup>a</sup>**



<sup>a</sup> Includes expenditure on associated extension activities.

Sources: DAFF, pers. comm., 3 March 2010; RDC annual reports; PC estimates.

## Research focus

Consistent with the overall pattern of rural R&D in Australia, the R&D procured by the RDCs has mainly, but not solely, been of an adaptive nature. In the past, there has also been a heavy emphasis on projects aimed at promoting productivity in the industries concerned — recognising that such R&D sometimes also had wider environmental and social benefits. More recently, as a quid pro quo for its funding contribution, the Australian Government has put pressure on the RDCs to give greater emphasis to R&D which addresses cross-sectoral and other broader issues. As discussed later in the report, views differ on how much of a change there has been in the RDC research balance and, indeed, on the extent to which substantial change could be sensibly pursued under the existing arrangements.

## Expenditure across research suppliers

Data on the share of RDC spending directed to the main research supplier groups is patchy. Indeed, many of the RDCs have not routinely collected such data (although, the CRRDC (sub. 128) is currently looking at coordinating such efforts across the program as a whole). However, based on data supplied by the RDCs directly to the Commission (figure 2.5), it appears that the most significant suppliers (in 2008-09) were State and Territory Government entities (35 per cent), followed by the universities (30 per cent), private sector (20 per cent) and CSIRO (15 per cent). These data, which include expenditure on extension services, show no definitive trend toward or away from particular research suppliers by the RDCs.

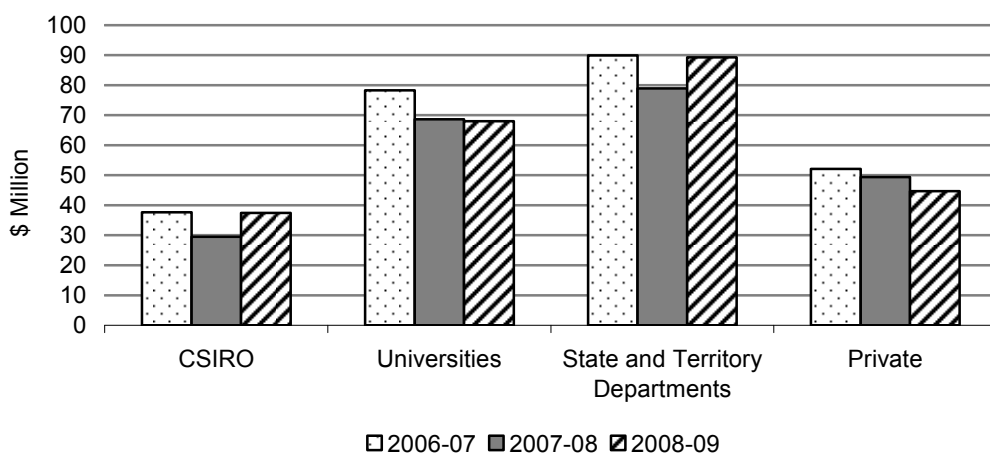
**Table 2.3 Estimated RDC expenditure and funding sources, 2008-09**

	<i>Industry contribution<sup>a</sup></i>	<i>Government contribution<sup>b</sup></i>	<i>R&amp;D Expenditure<sup>c</sup></i>	<i>Marketing Expenditure<sup>d</sup></i>
	\$m	\$m	\$m	\$m
<b>Statutory authorities</b>				
Cotton RDC	2.4	2.4	9.4	
Fisheries RDC	9.5	16.3	27.8	
Grains RDC	89.2	43.9	121.3	
Grape and Wine RDC	13.3	11.7	26.2	
Land and Water Australia	0.0	13.0	29.6	
Rural Industries RDC	3.9	16.5	23.8	
Sugar RDC	4.3	5.1	10.3	
<i>Subtotal</i>	<i>122.6</i>	<i>108.9</i>	<i>248.4</i>	
<b>Industry-owned corporations</b>				
Australian Egg Corporation Ltd	1.1	0.9	2.0	2.8
Australian Livestock Export Corp. <sup>e</sup>	0.8	0.0	0.8	3.3
Australian Meat Processor Corp. <sup>e</sup>	12.5	0.0	7.6	7.0
Australian Pork Ltd	3.1	2.8	5.5	10.5
Australian Wool Innovation	22.6 <sup>f</sup>	11.4	38.2	19.7
Dairy Australia	14.5 <sup>f</sup>	19.2	33.7	5.7
Forest and Wood Products Aust.	3.6 <sup>f</sup>	3.7	7.7	3.4
Horticulture Australia Ltd	40.9	39.8	83.2	14.7
Meat and Livestock Australia <sup>e</sup>	25.9	31.4	61.1	73.2
<i>Subtotal</i>	<i>125.0</i>	<i>109.2</i>	<i>239.8</i>	<i>140.3</i>
<b>Total</b>	<b>247.6</b>	<b>218.1</b>	<b>488.2</b>	<b>140.3</b>

<sup>a</sup> Includes statutory levies and voluntary contributions for R&D only. <sup>b</sup> Includes matching contributions only. Some RDCs also received a small amount of unmatched funding from other Australian Government programs. Also, charges for research performed for the RDCs by public sector bodies such as universities and State and Territory Governments have not always included a contribution to the overheads incurred by these entities. Hence, the total share of research costs met by government is almost certainly greater than indicated by these data. <sup>c</sup> Includes an allocation for overheads (though not necessarily on the same basis across individual RDCs), and funding for associated extension activities. Expenditure can be funded from sources of income other than industry and direct Government contributions, including royalties, interest and third party funding contributions. Payments received by the RDCs in any given year do not have to be spent in the same year. <sup>d</sup> Includes an allocation for overheads. <sup>e</sup> Australian Meat Processor Corporation and Australian Livestock Export Corporation levies are only matched by the Government when funds are channelled through MLA. To avoid double counting, these RDCs' industry contributions and R&D and marketing expenditure are netted out of MLA figures. MLA and the Australian Meat Processor Corporation industry contributions include voluntary payments made directly to the MLA Donor Company. <sup>f</sup> Producers pay a single levy for funding both R&D and marketing activities. Thus, industry contributions for R&D are estimated.

Sources: DAFF estimates and Productivity Commission estimates.

Figure 2.5 RDC expenditure on RD&E suppliers<sup>a</sup>



<sup>a</sup> Excludes data for entities which do not fall wholly within one of the above categories, such as Catchment Management Authorities. Also excludes expenditure with universities that was first directed to a CRC.

Source: Personal communication with RDCs.

## 2.4 The international context

Australia is a small player in global rural R&D, conducting less than two per cent of the world's agricultural research (Alston et al. 2010). As noted above, much of this research involves adapting technologies developed overseas to meet local requirements. That said, in certain industries such as cotton and rice, Australia is regarded as a world leader (see Pastoralists and Graziers Association of WA, sub. 114 and Ricegrowers Association of Australia, sub. 24).

### Research intensity

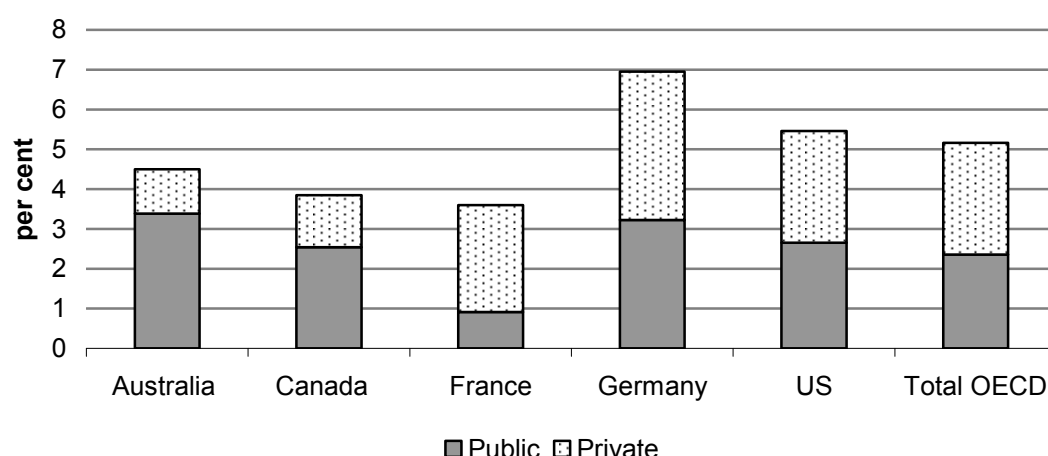
As noted earlier, the Commission's estimate of total public and private spending on rural R&D of some \$1.5 billion in 2008-09 represented around 3.3 per cent of the gross value of rural production. A variety of other estimates of so-called research intensity are available, both for Australia (Mullen and Crean 2006; Mullen 2010) and internationally (for instance, CRRDC, sub. 128; Frontier 2009; OECD 2009). However, these estimates do not include private sector expenditure. They also vary considerably — estimates for public sector research intensity in the United Kingdom range from around half of one per cent (Frontier 2009) to 3.5 per cent (CRRDC, sub. 128).



One study (Alston et al. 2010) does report both public and private sector data, allowing overall agricultural research intensities in several countries to be imputed. These data suggest that total (public and private) research intensity in Australia is higher than in Canada and France, but lower than in Germany, the United States and the OECD as a whole (figure 2.6).

These estimates should be treated with considerable caution given uncertainties about the underlying data sets used. For instance, while the much higher research intensity reported by Alston for Australia than the Commission's estimate might partly reflect time period differences, it might also be influenced by double counting of leveraged spending. Nonetheless, as elaborated on in chapter 5, these data broadly suggest that Australia's spending on rural R&D does not appear to be widely out of kilter with international norms, especially as countries such as the United States spend considerably more on ground-breaking research.

**Figure 2.6 Agricultural research intensities in selected countries<sup>a</sup>**



<sup>a</sup> To facilitate comparison all data are from Alston et al. (2010). However, Alston's estimates of Australian research intensity differ from the estimates by the Commission reported in the text.

Source: Alston et al. (2010).

## Government provides a relatively large share of funding in Australia

Compared to many other developed countries, rural R&D in Australia is particularly reliant on public funding. As discussed earlier, the Commission estimates that about 75 per cent of such research is publicly funded. By way of comparison, public funding comprises around two thirds of total funding for rural R&D in Canada, half of total funding in the United States, and around a quarter of total funding in the United Kingdom and France (Alston et al. 2010). Similarly, in its discussions in

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New Zealand, the Commission was told that government contributes between 50 and 60 per cent of total funding for rural R&D in that country, and that this share is continuing to decline.

### **Australia's RDC model is unique**

While other developed countries have statutory levies on various primary products, the organisations that are funded by such levies differ from Australia's RDCs in various ways. Notable differences include:

- *other countries do not provide matching public funding for levy contributions.* Indeed, only France appears to provide any ongoing government contribution to levy-funded bodies, and this comprises a small share of their total funding
- *Australia's RDCs have greater spending muscle.* For instance, while GRDC has an annual budget of around \$120 million, grains research organisations such as HGCA (United Kingdom) and the Western Grains Research Foundation (Canada) have budgets of around \$10 million and \$5 million respectively
- *the RDC arrangements give Australian rural industries greater influence on how public funding is spent.* By way of contrast, in Canada and the United States, much of the public funding for rural R&D is used for research within government departments of agriculture, with industries having less formal input into the setting of research priorities
- *the RDC model is comparatively well supported and well regarded.* There have been repeated legal challenges against levies in the United States, and a campaign to overturn the levy system has been launched in France.

Indeed, as discussed in chapter 6, Australia's unique RDC model appears to be highly regarded internationally.

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## 3 Why support rural R&D?

### Key points

- Soundly based rural R&D can have important benefits, including:
  - improving the productivity and competitiveness of the rural sector
  - contributing to better environmental and social outcomes
  - facilitating structural adjustment
  - strengthening rural communities.
- However, these benefits do not *on their own* justify public funding (or other forms of intervention).
  - Where producers would have been prepared to fully fund the research, there will be no gain to the community from government funding support.
- The key rationale for government intervention in rural R&D is to address ‘spillover’ effects, which would otherwise discourage producers from investing in some socially valuable research.
- A range of other arguments for government intervention have also been advanced, including to promote food security, support regional development, compensate for disadvantageous trade conditions, foster infant industries and develop value-adding supply chains.
  - However, for various reasons, these arguments do not provide sufficient — or possibly even good — grounds for intervention.
- While intervention may be justified to address spillover-related ‘market failure’, this need not involve public funding support.
  - In some cases, intellectual property protection can be sufficient to overcome under-investment concerns.
  - Government-facilitated producer levies can mitigate the risk of ‘free riding’ by compelling all participants in a given industry to contribute to the cost of R&D.
- But in many cases such mechanisms are unlikely to fully correct for under-investment. Hence, public funding for R&D is warranted to promote socially efficient outcomes.
- The aim of such funding support should be to induce socially valuable rural R&D that would not otherwise have occurred.

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With Australian governments contributing in excess of \$1.1 billion annually towards the cost of rural research and development (R&D), it is important that there be a cogent basis for this significant investment.

Several of the desired outcomes of rural R&D are captured in the objectives of the *Primary Industries and Energy Research and Development Act 1989* (Cwlth):

- (a) increasing the economic, environmental and social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries; and
- (b) achieving the sustainable use and sustainable management of natural resources; and
- (c) making more effective use of the resources and skills of the community in general and the scientific community in particular; and
- (d) improving accountability for expenditure upon research and development activities in relation to primary industries. (s. 3)

In some respects, the pursuit of these and other benefits (section 3.1) may be treated as *de facto* rationales for government intervention. However, pursuing these on their own, without reference to the ways in which government can add value to investment decisions, could in fact be detrimental. Thus, it is important to establish a conceptual framework in which well-grounded decisions for government funding of rural R&D can be made (section 3.2). Importantly, many of the commonly cited arguments for public funding support do not meet this test (section 3.3). Furthermore, funding support is not the only way by which governments can promote appropriate investment in R&D, although the alternative mechanisms will likely be insufficient — on their own — in helping to ensure that all socially valuable research is pursued (section 3.4).

## 3.1 The benefits of rural R&D

The inherent diversity of the agriculture, fisheries and forestry sector translates to a broad research agenda, with the direct benefits from rural R&D taking many forms (box 3.1). For instance, industry benefits can include:

- lower costs for producers
- enhanced supply chain knowledge and management
- reduced impact from pests and disease.

Consumers and the wider community can also benefit, through such things as:

- better standards of living (through cheaper and higher quality food)

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### **Box 3.1 Rural R&D can deliver a wide range of benefits**

The Commission received numerous detailed descriptions of R&D projects undertaken across the agriculture, fisheries and forestry sector and the benefits they provided. This box contains a small selection of the commentary.

#### **Higher productivity and competitiveness**

The most obvious [benefit] is through direct productivity improvements from new production technologies or techniques, or through new breeds and varieties. (Australian Centre for International Agricultural Research, sub. 118, p. 5)

R&D has been an important contributing factor delivering both increasing genetic potential and agronomic performance. (Sugar Research and Development Corporation, sub. 140, p. 18)

The outcome [of a prawn domestication program] has been that yields have risen 4-8 tonnes per hectare to one farm recently averaging 17.5 tonnes per hectare over the whole farm. The increased yield has led to increased profit and ability to better compete on domestic markets with imported prawn products. (Fisheries Research and Development Corporation, sub. 113, p. 27)

Maintaining a watching brief on international [R&D] activities is vitally important for local industries to remain competitive. (Department of Primary Industries, Parks, Water and Environment — Tasmania, sub. 148, p. 15)

#### **Improved environmental outcomes**

[Cotton Research and Development Corporation] investments in integrated pest management and uptake of biotechnology R&D have been strong drivers of reduced pesticide use ... [which] has resulted in improved environmental outcomes in cotton communities ... over the last 20 years. (Cotton Australia, sub. 68, p. 12)

... research into the carbon sequestered in street trees in urban communities has indicated that between 11 and 31 tonnes of carbon per hectare can be sequestered. Given that urban areas are increasing, the carbon sequestered in urban vegetation will become larger and more relevant in future discussions surrounding strategies to mitigate climate change. (Nursery and Garden Industry Australia, sub. 87, p. 18)

Application of scientific knowledge has allowed development of the following innovations: techniques for harvesting and regenerating a wide variety of forest types, effective fire management, ... and efficient and effective forest health surveillance processes. (Forestry Tasmania, sub. 67, p. 2)

#### **Social benefits**

[Research] outcomes have contributed to a reduction in food borne illness due to egg consumption. (Australian Egg Corporation Limited, sub. 119, p. 14)

Many emerging agricultural industries provide opportunities for Indigenous Australians to gain employment, often on traditional land. ... [Rural Industries Research and Development Corporation] has funded research to help in developing these industries, and research has identified specific opportunities for Indigenous communities. (Rural Industries Research and Development Corporation, sub. 92, p. 36)

Livestock producers and exporters have been prepared to fund [R&D and extension] and incur increased costs in adopting the outcomes almost entirely to address a societal issue — the concern of the Australian public for the welfare of livestock exported from Australia. (LiveCorp, sub. 57, p. 27)

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- improved environmental amenity
  - greater capacity within rural communities to adjust to changing circumstances (which may in turn reduce calls on the welfare system).

These are not discrete categories — any given R&D investment can lead to a mix of benefits for different parties. For example, pests that cause damage to crops might also blight backyard gardens, and hence efforts by producers to prevent or limit pest outbreaks may be beneficial to others in the community. In the other direction, the provision of high quality food can generate health benefits for consumers — and insofar as this encourages them to buy more fresh produce, benefits may flow back to producers. Indeed, in many ways, benefits to producers and benefits to the community are heavily intertwined. For example, producers may have a strong commercial incentive to sponsor R&D into animal welfare where the public's unease about particular practices risks undermining the industry's 'community licence to operate'. The same might also be true for environmental R&D, including into conservation and natural resource management issues — although, as discussed in section 3.4, community pressure alone may be insufficient to encourage investment in R&D where the benefits primarily accrue to the wider community.

Much empirical work has attempted to quantify the returns from investment in rural R&D (box 3.2 and appendix B). One commonly cited source (Mullen 2007) indicates a rate of return in Australian broadacre farming of between 15 and 40 per cent, with the Commission's own assessments (PC 2007) suggesting potentially higher average returns. More recently, an evaluation of projects undertaken by Australia's Rural Research and Development Corporations (RDCs) has estimated that for every \$1.00 invested in R&D, the average return after 25 years is \$10.51 (CRRDC 2010) — broadly equating to a rate of return of around 50 per cent.

At the same time, there is large variation across industries and projects (as well as in the assumptions underpinning the studies themselves). Indeed, in many respects, the idea of an 'average' R&D project is a misnomer, such is the uncertain nature of research outputs and the extent to which they will be adopted. Nonetheless, whatever the precise magnitude of the gains, almost all studies suggest that soundly based rural R&D can deliver significant benefits for both primary producers and the broader community.

## **Assessing the case for intervention**

Beneficial R&D outcomes are not 'ends' in themselves when it comes to justifying government intervention. Rather, they provide a mechanism through which overall community welfare *might* be improved.

### Box 3.2 Quantifying the returns from rural R&D

Empirical research on the returns from investment in rural (and other) R&D was comprehensively examined in the Commission's 2007 report on public support for science and innovation. As the table below indicates, the reported returns in much of the literature — though variable — are high on average.

#### Estimated returns from rural R&D are high but variable

	<i>Alston et al. (2000)</i>		<i>Mullen &amp; Cox (1995) and Mullen (2007)</i>	<i>Shanks &amp; Zheng (2006)</i>	<i>PC (2007)<sup>a</sup></i>	
<i>Average returns</i>	<i>Research &amp; extension</i>	<i>Research only</i>				
Point	%	81	100	..	24	57
Range	%	..	..	15–40	1–46 <sup>b</sup>	48–68

<sup>a</sup> Based on studies examined by OTA (1986) and IC (1995). <sup>b</sup> Confidence interval of plus or minus two standard deviations from the point estimate. .. Not applicable.

More recent empirical work has provided a different take on the value of rural R&D. In particular, work by Sheng, Mullen and Zhao (2010) implies that real reductions in public investment for rural R&D since the mid-1990s have contributed to a decline in the rate of agricultural productivity growth in Australia.

#### Assumptions affect results

Like any quantitative work of this nature, the reported results are heavily influenced by assumptions.

- A key issue is the extent to which productivity growth is attributed to R&D investment relative to other productivity drivers.
  - Farm consolidation has promoted greater efficiency (with better-performing producers able to take over less efficient operators) and economies of scale.
  - R&D benefits can be embodied in other products and technologies used in (but not explicitly developed for) the rural sector. For example, the internet provides easy access to real-time information, while the development of the Global Positioning System has enabled the growth of 'precision farming' practices.
  - Rates of educational attainment have improved in the rural sector. Between 1984 and 2004, the proportion of agricultural workers with university qualifications increased by more than for the Australian workforce as a whole (PC 2005).
  - The removal of trade barriers and other regulatory impediments has increased competition, stimulating improvements in farming practices and innovation.
- The integrity of results can be materially affected if the selection of R&D projects is not random. In particular, it can be difficult in *ex post* evaluation to take account of projects which are abandoned early. This can lead to an upward 'selection bias'.
- Assumptions regarding the length of time before R&D leads to commercial applications, and in turn about the rate of producer uptake of such products, can

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### Box 3.2 (continued)

have a similarly pervasive influence on the results. Most evaluations are conducted within two or three years of research being undertaken — well before full benefits have been realised. For example, Alston, Pardey and Ruttan (2008) suggest that complete adoption can take up to 30 years for varietal innovations (for example, hybrid corn) and up to 50 years for mechanical and major technological innovations (for example, tractors or telephones). Hence, even in *ex post* evaluations, considerable extrapolation based on past experience is typically required, and such extrapolation may err on the side of overestimating the rate of adoption and underestimating the associated costs. A further complication is the difficulty of accounting for research obsolescence when adoption occurs over an extended period of time, during which even better technologies become available.

- R&D is an evolving process, with new projects commonly drawing upon knowledge acquired through prior innovations both in Australia and overseas. Indeed, much domestic R&D adapts overseas innovations to local conditions. Commonly, the past costs associated with generating this knowledge will not be factored into any current project evaluation. (By the same token, the benefits that may flow from a present-day project — in terms of new knowledge contributing to *future* R&D — will also tend to be excluded.) Such intertemporal impacts are not necessarily relevant to an individual entity's decision to invest — it will only be interested in the benefits and costs it directly faces. However, their exclusion when assessing the returns to the broader community places a further caveat on the results.

Beyond these general issues, there will usually be methodological issues and contestable assumptions specific to different studies. Thus, for example, there are various question marks attached to aspects of the aforementioned work by Sheng, Mullen and Zhao (2010). These include whether there has in fact been a trend decline in productivity in the rural sector as a whole, and the extent to which any reduction in public spending on rural R&D has been offset by higher private investment.

These effects taken together justify considerable caution in interpreting the reported returns from investments in rural R&D. In fact, it may be that the true returns are considerably lower than many common estimates. For example, an analysis of portfolio assessments (encompassing a mix of both rural and non-rural R&D projects) previously undertaken by the Commission reported an average portfolio-based benefit–cost ratio of around 2:1, compared to an average of over 40:1 for project-specific evaluations (PC 2007). Nevertheless, that same portfolio analysis still reinforces the notion that there are good returns, on average, from financing rural R&D.

Source: Appendix B.

Where investment would have been undertaken anyway, government funding does not contribute to a better outcome for society. Indeed, to invest public money purely on the basis of there being a net benefit for the community would see government providing funding support for myriad causes across the economy. Consequently, government funding for projects is only justified where there are clear reasons why



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the private sector will fail to sufficiently invest, and if alternative mechanisms are likely to be either impractical or ineffective in resolving such market failure.

In this latter regard, it is important to recognise that while markets are inherently imperfect, it is often the case that the policy mechanisms that could be used to address private under-investment in rural R&D are themselves flawed. Hence, it is not sufficient merely to identify a weakness in the market. Instead, there must be a likelihood that public funding or some other government intervention will provide a benefit to the community that exceeds the cost of intervention (box 3.3).

### **Box 3.3      Costs of government intervention**

Governments intervene in many markets, often with positive outcomes. However, such interventions are never without costs.

First, government programs — including R&D funding support — involve direct costs to both the public and private sectors. Entities seeking public funding for particular research projects will face compliance costs. These can result from the need to submit applications, complete detailed financial accounts, or attend meetings to justify and explain proposals. In turn, government agencies such as the Department of Agriculture, Fisheries and Forestry or the Department of Innovation, Industry, Science and Research will incur staffing and administrative costs associated with the need to review reports and approve applications for support. (Moreover, such compliance and administration costs are incurred whether or not a given project ultimately secures public support.)

Second, government spending requires revenue to be raised — a process that also generates costs. Thus, a dollar raised in taxation will provide less than a dollar for spending by government. This is partly due to collection costs. In addition, the (dis)incentive effects inherent in taxation can cause people to change their purchasing and investment behaviour. While estimates vary across the literature, the Commission has previously indicated an average efficiency cost associated with taxation revenue raising of around 30 per cent (PC 2001). Viewed another way, if these costs are not explicitly factored into decision making, the benefit–cost ratio of a worthwhile project would need to be at least 1.3 to merit public funding.

Third, in a practical sense, the amount of money that governments can spend is constrained. To the extent that public funds available are finite, there is an opportunity cost to government from spending a dollar on rural R&D — that dollar cannot be spent elsewhere. In the presence of competing demands for taxpayer dollars, policymakers must inevitably have regard for the likely payoffs from alternative spending options. Indeed, in commenting on these matters, Across Agriculture (sub. 116) went so far as to suggest that this is the critical issue for assessing public funding of rural R&D.

While such observations do not fundamentally undermine the case for public funding support for rural R&D, they do highlight a commonly ignored dimension of government action in this area.

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In total, while policy approaches focused on achieving ‘desirable’ research outcomes can be useful in shaping research agendas, they cannot of themselves provide a sensible basis for determining how the funding burden should be shared between public and private parties.

## **3.2 Market failure**

The prevailing view across submissions was that the primary rationale for government intervention is to address instances of under-investment in rural R&D by the private sector. There was also general consensus from participants that the ‘market failure’ of most concern relates to ‘spillover’ benefits that can attach to research activities.

Spillovers — also known in economic parlance as externalities — are benefits or costs resulting from a transaction that accrue to a party not directly involved in that transaction. Although R&D projects will provide private benefits to an entity that pays for a piece of research, other parties may also benefit from that investment. These spillovers matter in a policy sense as individuals and businesses will typically consider only the private benefits and costs they face, not the benefits or costs that accrue to third parties. Consequently, there may be insufficient incentives for private investment in some R&D projects that could make society as a whole better off. While the determining factor is the relative balance between costs and benefits faced by the private investor, a reasonable observation would be that the larger the share of benefits accruing to external (non-paying) parties, the more likely it is that the investment will not be made.

The economics of spillovers and their policy ramifications have been widely explored in the literature, by the Commission in its 2007 report on public support for science and innovation, and in submissions to this inquiry. Hence, the Commission does not intend to reiterate this detail here.

However, there are some particular matters of relevance to the subsequent discussion on the policy implications of spillovers, which are worth noting at this juncture. First, benefits can spill over to a range of parties, including:

- fellow producers in the same industry (intra-industry spillovers)
- businesses operating in other industries (inter-industry spillovers)
- the wider community
- overseas entities.

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Second, the nature of how benefits can spill over to different parties means the appropriate strategy for correcting market failures can depend on the particular circumstance (section 3.4). Third, the beneficiaries of spillover effects can vary over time. As one firm's innovations are adopted by rivals, the cost advantage (from more efficient technologies or production processes) or price premium (due to product differentiation) that the firm initially enjoyed will be competed away. As a consequence, prices across the industry will fall, meaning that an initial spillover to producers within the same industry may eventually materialise as a benefit to consumers. Similarly, and as noted by the Victorian Department of Primary Industries (sub. 161), the significance of any particular market failure may change over time. For example, as the knowledge base in a particular area grows, research founded on that knowledge may become more commercially viable, in turn lessening the likely extent of market failure.

### **Additional 'market failures'**

In addition to spillovers, some other market failure rationales for public support for rural R&D have been suggested. These include:

- risk and uncertainty
- indivisibilities.

Also, although not strictly a market failure argument, the need for government to invest in R&D to support its own activities is sometimes raised in this context.

#### *Risk and uncertainty*

R&D is intrinsically risky. Owing to the uncertain outcome from any individual R&D project, costs will be incurred regardless of whether there is any successful output. Even a 'success' in a technical sense might not be matched by commercial success — an idea that comes to fruition through R&D could still fail to find a market or become profitable, especially if commercialisation pathways and other costs of adoption are neglected in project planning and delivery.

Nonetheless, the presence of risk is not of itself a sufficient reason for intervention. Risk attaches to many aspects of business and, indeed, daily life — governments do not 'step in' to reduce risk in all of these cases. In fact, markets provide some effective mechanisms for managing risk: sharemarkets spread risks across a range of investors, allowing companies to raise capital more effectively than if they were forced to seek funding from a single source. Households can guard against the risk of property damage or theft by taking out insurance. These mechanism are not

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unfamiliar to the rural sector either: producers can hedge against adverse price changes for agricultural commodities, or take out insurance against loss of income.

For rural R&D specifically, access to risk spreading mechanisms may be relatively limited. The venture capital market — a prime source of financing for innovations — is less developed in Australia than in some other developed economies. Given the relatively small scale of many projects, it is hard to imagine significant venture capital interest in many parts of the current rural research portfolio. Moreover, the Department of Agriculture, Fisheries and Forestry (DAFF, sub. 156) observed that the effect on investment of often limited access to risk-spreading mechanisms may be exacerbated by the long lags between initial investments and the generation of a commercial return (section 3.4). This implies that private sources of funding for rural R&D in Australia will be constrained, in turn increasing the cost of securing project financing, and potentially precluding investment in some projects that might have proceeded with readier access to capital.

However, government intervention to compensate for such financing cost pressures would itself entail significant risks. Like the private sector, governments face costs in assessing which projects they should and should not invest in. Moreover, the cost ultimately borne by the community may arguably be higher, given both the greater distance of government from the market and the potential for political harm to be inflicted by any investment failure — or, indeed, any *perceived* failure. Thus, in order to avoid admitting that they had backed ‘losers’, governments may be politically locked into financing poor projects well beyond what would be intrinsically appropriate.

Furthermore, levy arrangements (section 3.4) essentially provide a form of risk ‘pooling’ for rural R&D. Rather than any individual entity bearing all of the potential downside of a risky investment, levy arrangements enable the industry to collectively invest in a diverse portfolio of R&D projects. This risk-sharing arrangement reduces the cost to any one firm from unsuccessful projects (and will do so even without a government co-contribution), not only because this cost is spread across all contributing firms, but also because the losses may be offset by the returns from successful projects. Thus, in the Commission’s view, the risk inherent in R&D does not provide a strong basis for government support. (That said, as discussed in section 3.4, not all firms in a given industry might benefit in the same way, or at all, from successful levy-funded projects. Accordingly, while risk does not, on its own, provide a strong basis for public funding support, risk may materially affect the rate at which levies are set, which *in turn* could lead to sub-optimal private investment in rural R&D.)

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### *Indivisibilities*

By international standards, the Australian market for many rural industries is small. (Moreover, the diversity of climatic conditions across Australia means that R&D for a given industry cannot always be applied in all parts of the country.) Hence, for multinational entities funding rural R&D, the potential returns may be much higher for research directed at meeting the requirements of the larger US or European markets. As DAFF argued:

Information is an indivisible commodity, and the potential return from creating a piece of new information will grow according to the number of possible applications. Thus, the expected return from one dollar of R&D will be greatest in the largest market. Firms undertaking global rural R&D will compete for returns from the largest markets neglecting a relatively small market like Australia if conditions differ from those in the USA and EU. (sub. 156, p. 12)

However, while potentially impeding initial high-risk and innovative R&D, such indivisibilities need not constrain adaptive research that draws on an initial innovation. Australia is often in a position to ‘free ride’ off R&D undertaken overseas, adapting foreign results to local conditions. Though potentially meaning that commercial applications take longer to materialise, this process is in many cases likely to be considerably cheaper than Australia trying to undertake (and pay for) its own path-breaking work. To the extent that levies prevent free riding on domestically focused adaptive work, there does not appear to be a fundamental market failure attached to Australia’s ‘small’ status that would warrant public funding support.

That said, in some contexts, solely adaptive R&D may not be sufficient to meet the needs of Australia’s rural industries — some more fundamental, locally conducted research will also be required. (It has also been suggested that Australia needs to undertake a certain amount of original R&D in order to obtain access to early results from overseas research.) Some such projects may be too large and expensive for most business to finance on their own, and even modest projects may be beyond the means of individual producers. But here again, and as acknowledged by DAFF (sub. 156), collective funding through levy arrangements provides a means for producers to pool resources and invest in R&D that they could not undertake individually.

On the whole, with a government-facilitated levy system in place, indivisibilities would seemingly be a weak basis for providing public funding support.

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### *Government research support for its own activities*

In general terms, R&D can be a direct input to government activities. As a supplier of services to the public, a government's own processes and output could be improved through innovation. To this end, investments in R&D can directly benefit governments in terms of their provision of public services (with indirect benefits to the broader community who rely on those services) (PC 2007).

In a rural R&D context, this basis for public funding support could be relevant in relation to some of the regulatory and policy roles performed by government. For instance, governments may need to ensure that their knowledge and expertise on potential biosecurity threats to the rural sector and the wider community is kept up to date (a point emphasised by several participants, including Cotton Australia, sub. 68; Cattle Council of Australia, sub. 83; Apple and Pear Association Limited, sub. 86; Tasmanian Farmers and Graziers Association, sub. 89; Department of Primary Industries — Victoria, sub. 161). Similarly, research is likely to be important in helping policymakers to make the case for continued liberalisation of global markets for agricultural products.

Even so, as governments are not generally producers in the rural sector (with the notable exception of forestries), this rationale for public funding support is likely to have less overall force than in some other parts of the economy.

## **3.3 Other arguments for government intervention**

In addition to market-based rationales for funding rural R&D, participants proposed several other justifications for public funding support, including:

- promoting food security
- supporting regional development
- compensating for assistance afforded to producers overseas
- fostering 'infant' industries
- developing the value chain.

### **Promoting food security**

Ensuring people have access to affordable and nutritious food is an unobjectionable goal. As the global population continues to increase, and with the urbanisation of land previously used for farming, feeding the world will require more productive use of available agricultural resources. It is commonly argued that R&D therefore

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has an important role to play in boosting agricultural productivity, so as to enhance the ongoing security of food supplies.

In a foreign aid context, the risk of hunger and famine affecting developing countries provides a strong reason for supporting measures to enhance food security. Pardey and Alston (2010) argue that declining public investments in rural R&D ‘will likely have enduring and global consequences in terms of the world’s supply of basic foods and feeds’ (p. 13). Specifically, they contend that any consequent reduction in the sector’s productivity growth will translate to developing country consumers facing higher — and unaffordable — prices for food. Pardey and Alston further suggest that developed countries should increase their funding for rural research to avert this scenario. Along these lines, some participants argued that Australia has a ‘moral obligation’ to invest in rural R&D for the benefit of developing countries (for example, Victorian Farmers’ Federation, sub. 65; Department of Industry and Investment — NSW, sub. 69; Australian Chicken Meat Federation, sub. 77).

However, while R&D clearly has a role to play in this context, it is nonetheless only one of several options for improving food output. Of particular relevance in this context is the pervasiveness of subsistence farming in the developing world. Where supply chains are deficient or non-existent, such that farmers are unable to reliably supply their produce to markets, the incentive to increase output is severely weakened. Hence, measures that reduce barriers to trade and improve market access are likely to generate significant (and relatively rapid) returns for developing countries, and thereby lessen the prospect of persistent food insecurity. As the Australian Centre for International Agricultural Research (the key Australian participant in managing rural R&D efforts for developing countries) emphasised, without appropriate policy and institutional settings — such as those that enable market access — the benefits of scientific research are unlikely to be realised (sub. 118).

More generally, any upward pressure on food prices overall will in turn provide further private motivation for productivity improvements and output increases — especially if market access is liberalised. In this sense at least, private R&D investment will be a consequence of the broader market environment rather than a driver of it. In addition, insofar as Australia has a moral obligation to feed people in other countries, it is not a matter for rural R&D policy *per se*. Rather, and as is currently the case, it rightly forms part of the international aid program administered by the Department of Foreign Affairs and Trade. (Indeed, it is precisely on this basis that the Australian Centre for International Agricultural Research is funded.)

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The food security argument is also considerably less compelling in a domestic context. Notwithstanding prolonged drought conditions in much of the country, Australia remains a net exporter of agricultural produce, with 56 per cent of all farming output sold overseas (DAFF, sub. 156). While there is variability across different industries, on the whole, the prospects of Australian food supplies ‘running out’ would appear remote.

## **Supporting regional development**

Soundly based public funding support for R&D that facilitates more productive rural industries will have significant flow-on benefits for rural communities. Not only are producers likely to enjoy higher incomes, but the conduct of the R&D — where at least some of it is performed locally — will provide local employment opportunities, both directly and through the flow-on benefits from greater local spending and investment. Given such benefits, some participants argued that public funding for R&D should be provided with the clear objective of supporting regional communities (for example, Ian Rogan, sub. 1; Australian Institute of Agricultural Science and Technology, sub. 12; Australian Lot Feeders’ Association, sub. 19; Victorian Farmers’ Federation — Livestock Group, sub. 27; Cattle Council of Australia, sub. 83; Australian Wool Innovation, sub. 110; NSW Farmers Association, sub. 145; Australian Mushroom Growers Association, sub. 155).

There is inherent value in maintaining vibrant regional communities. Moreover, structural changes in the Australian economy may be perceived as imperilling this vitality. In particular, with population movements towards the urban areas, some rural towns and regions have been (and will likely continue to be) adversely affected.

However, it is difficult — and usually counterproductive — to try to combat such adjustment pressures. Enterprises that clearly have no longer-term viable future should be allowed to close, rather than be sustained by ongoing subsidies or other similar mechanisms. What is required in this context is to facilitate transition, providing appropriate support to mitigate the financial and social costs to farms and families. While having some capacity to ease such adjustment costs, public funding for rural R&D will generally be an oblique (and, therefore, potentially less effective) way of achieving this aim. Indeed, there is a risk that public funding support could work against other policies designed to promote structural reform.

Conversely, where rural industries are intrinsically competitive, then, as noted above, investment in R&D can clearly help to reinforce market position, in turn generating benefits that spill over to surrounding regions. But this then becomes



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simply a manifestation of the more general case for public funding support (section 3.2), rather than a strictly additional argument.

### **Compensating for assistance to overseas producers**

Many participants observed that Australia competes on an uneven playing field in global markets, with other countries routinely subsidising their agricultural producers (for example, Auscott, sub. 5; Australian Institute of Agricultural Science and Technology, sub. 12; Australian Lot Feeders' Association, sub. 19; Tony Fisher, sub. 25; Citrus Australia, sub. 66; John Keniry, sub. 80; Grains Research and Development Corporation, sub. 129; Corporate Agriculture Group, sub. 134; Department of Agriculture and Food — WA, sub. 137; DAFF, sub. 156). Public investment in rural R&D is therefore seen by some to be a suitable compensatory mechanism for unfair practices abroad (at least partly because such public R&D investment is generally permitted under international trade rules).

Trade distortions are costly, which is why Australia has actively sought to promote trade reform at a global level. For at least two reasons, this is a preferable approach to providing domestic offsets (including through rural R&D funding):

- It is wrong to view R&D subsidies as benign. If not necessary to address genuine market failures, the costs imposed on other sectors of the economy and the wider community will exceed the benefits to the rural sector. Hence, Australia as a whole will be worse off.
- If R&D funding were perceived as being used to 'countervail' more explicit trade support provided in other countries, Australia's credibility and authority when negotiating in multilateral forums for trade liberalisation would be weakened.

Furthermore, even were the merits of the countervailing argument to be accepted, support for rural R&D would again generally be an indirect and potentially ineffective mechanism for implementing such an approach — particularly if the R&D undertaken in Australia could in turn be adapted by overseas producers for their own advantage.

### **Fostering 'infant' industries**

Australia's rural sector has made an important economic contribution over a long period of time. However, as the suite of individual industries catered for by the Rural Industries RDC, Horticulture Australia Limited and the Fisheries RDC illustrates, some are of much more recent origin than others.

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Some participants asserted that promoting these infant industries should be an explicit objective of rural R&D policy. For example, the Australian Olive Association argued that ‘there should be increased matching R&D funding available as new industries expand and more seed R&D funding for new and emerging industries, some of which logically don’t exist yet’ (sub. 97, p. 4). More specifically, Australian Green Tea suggested that as emerging industries — such as green tea — are not generally subject to statutory levies, ‘the success of [a new] industry may require up-front funding for comprehensive feasibility studies’ (sub. 138, p. 1).

To the extent that soundly based public funding support for R&D facilitates the emergence of new rural industries, this is an eminently desirable outcome. However, such support must be compatible with a more efficient overall use of resources across the economy. Where the overall quantum of funding support is fixed (given the costs of, and limits to, government revenue raising — see box 3.3), more support for infant industries necessarily means less support for others. In this vein, the Australian Superfine Wool Growers Association observed that ‘often governments are keener to provide incentives to sunrise industries at the expense of well-established core industries that are facing market difficulties’ (sub. 9, p. 30).

Were it possible to establish that market failure related under-investment was a bigger problem in emerging industries than in established ones, then a shift in the funding balance could potentially be beneficial for the community. However, it is not clear why this should necessarily be the case — especially as new industries can establish levy arrangements, whether through voluntary co-operation or government facilitation (the scope for which is examined in chapter 9).

Moreover, there is a fine line between ensuring that emerging industries have reasonable access to government support mechanisms and furnishing ‘infant’ industries that never ‘grow up’ with public assistance in perpetuity. As chapter 7 discusses, at a practical level, determining the bases on which an industry might be judged as ‘infant’ would also be far from easy.

Therefore, the Commission does not see the infant industry argument as constituting a robust justification for funding support of rural R&D.

## **Developing the value chain**

While Australia exports much of its rural production, in some cases, the raw product is processed abroad and then imported back into Australia. On the face of it, this might be seen as a lost opportunity, and indicative of the need for investments in

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R&D to further develop domestic links in the supply chain — in the common vernacular, ‘from paddock to plate’.

However, where processing occurs overseas, this is generally because it is more cost-effective to do so. It will only be sensible to process products in Australia where the processing cost is less than the value added to the raw product — in other words, where Australia has a ‘comparative advantage’ in the processing activity. On occasion, R&D may well help to reinforce or even create a comparative advantage in specific processing activities. But here again, the key question with regard to government funding is whether there are reasons to presume that private entities would under-invest in R&D of this nature.

Notably, as discussed in chapter 9 in relation to processor levies, there are reasons to believe that the likely degree of private under-investment in R&D related to value-adding activities will typically be less than for research related to the production of the raw commodities. This is because the greater capacity to conceal the nature of process-related R&D, or to limit the access of third parties to it through IP mechanisms, will reduce the likely extent of any free-rider problems. Absent genuine and significant market failures, arguments for public funding for R&D to build domestic capacity in downstream value adding are little different from the problematic infant industry argument (see above).

In short, both the contention that Australia should necessarily be seeking to undertake more food-related value-adding activity, and the consequential perception that this justifies public funding for R&D, are highly questionable.

### **3.4 Forms of government intervention**

Although a number of the justifications advanced for government intervention to support rural R&D do not stand close scrutiny, the spillover benefits from research activities mean that, absent intervention, there would almost certainly be under-investment in rural R&D from the community’s point of view.

However, this does not immediately imply that governments should directly fund R&D. There are a number of different policy options that should be assessed, and that could potentially deliver comparable outcomes at lower cost to society. These include intellectual property (IP) rights and industry levies. (Reforms to reduce regulatory burdens can also help to increase the returns to private investment in R&D, as discussed in box 3.4.)

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### Box 3.4      **Regulatory reform**

Regulation can sometimes act as an obstacle to innovation — for example, barriers to entry in a particular industry can preclude creative upstarts from emerging. More fundamentally, regulation can increase costs or reduce the expected benefits to private firms from R&D — or even remove any incentive for investment in particular types of research. For example, if the compliance costs associated with the approvals process for veterinary chemicals were regarded as unduly onerous, this might discourage investment in new animal health treatments. Similarly, as identified by the Council of Rural Research and Development Corporations (sub. 128), restrictions on the use of new technology and techniques — for instance, genetic modification for plant breeding — can also hinder private investment in rural R&D.

But while less restrictive regulatory arrangements may be beneficial for investment in R&D, there may well be offsetting costs. (The regulation of veterinary chemicals is a case in point, given the potential harm that might come to food supplies, and the animal welfare implications.) Accordingly, regulation cannot (and should not) be set with reference to R&D outcomes alone.

Additionally, any reforms to address regulatory impediments are only likely to encourage private entities to invest in more rural R&D insofar as they increase the potential net *private* gains. That is, they will not address any spillover issues that may result in under-investment from the community's point of view. Further, as Across Agriculture (sub. 116) observed, in areas such as chemicals regulation, Australia is only one of many markets where regulatory approvals are required. Hence, streamlining initiatives by Australia alone may have little impact on private incentives to invest in R&D.

Consequently, even in a market with the most investment-friendly regulatory and legislative settings for rural R&D, under-investment (from the community's perspective) can still result.

## **Intellectual property rights**

Some innovations can be successfully 'hidden' from rivals, such that the benefits accrue only to those who invest. Moreover, even where secrecy cannot be maintained, various legal mechanisms can be used to protect investors' rights.

Indeed, a well-functioning copyright, trademark and patent system can provide significant incentives for R&D by rewarding successful innovators with the exclusive right to use, or licence the use of, the results of their work. This can reduce the potential for free riding, allowing investors in R&D to appropriate a greater portion of the benefits.

However, IP protection is likely to be more effective in some industries than others (box 3.5).

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Finally, determining how far IP rights should extend is challenging. In particular, too restrictive an IP regime could prevent researchers from building on each other's work. From society's perspective, while having some R&D is clearly better than no R&D, beyond a certain point, additional IP protection hinders rather than helps researchers.

In summary, while patents and other IP mechanisms are useful to a degree, they are not panaceas in dealing with spillover problems and the under-investment in R&D that can ensue.

### **Box 3.5      The limits of intellectual property**

The extent to which a business can take advantage of the IP regime depends on the nature of the industry it operates in, and the goods and services it supplies. For example, the pharmaceuticals industry is a relatively intensive user of patents. This is not only due to the scale of the investments involved, but also because it is fairly easy to detect any 'copying' of a proprietary compound used in another company's product.

However, it is not only extensively researched and developed drugs that may have medicinal qualities. The Australian Honey Bee Industry Council (sub. 6) noted the claimed antibacterial properties of Manuka honey. Here too, research can be beneficial to suppliers — since discovery of its potential medicinal application, prices for Manuka honey 'were said to have increased tenfold' (sub. 6, p. 7). However, Manuka honey is a naturally occurring product. While R&D can reveal the benefits of different types of honey, there is no IP that can be called upon to give a single producer a monopoly — any apiarist whose bees feed off the flowers of Manuka bushes is in a position to supply the product.

The small size of the Australian market may also be an impediment to the effectiveness of IP protection in facilitating efficient levels of R&D. Thus, in commenting on the situation in the red meat and livestock industry, Meat and Livestock Australia noted that:

... [IP] protection is not sufficient in itself and a significant potential market is also required to attract private investment. For example, while the [IP] of new meat processing equipment can often be protected, overseas equipment manufacturers do not typically adapt equipment to suit the Australian market because of its small size (only around 160 processing plants of sufficient size) and the Australian market is not generally considered large enough to support the emergence of local specialised equipment manufacturers. (sub. 106, p. 23)

A further constraint exists where there is a potentially large number of users: the enforcements costs for any one firm may simply be too high for IP protection to be worthwhile. For example, the Australian Academy of Technological Sciences and Engineering highlighted:

While new plant varieties can be protected and there are well known examples of commercial plant varieties where there is a high level of enforcement, other examples show how difficult enforcement can be — such as when overseas growers obtain cultivars of Australian native plants and grow them for foreign markets. (sub. 37, p. 5)

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## Levy arrangements

Industry-wide levies are another mechanism used in many countries to facilitate rural R&D. In effect, through pooling research resources, levy arrangements ‘internalise’ *intra*-industry spillovers. That is, they provide a means to ensure not only that all participants in an industry can benefit from R&D but also that all contribute to the costs. Furthermore, since the RDCs sometimes jointly conduct research (chapter 4), *inter*-industry spillovers can potentially be captured and internalised within a broader range of rural producers. Thus, the Australian Government collects a levy on behalf of many rural industries, the revenue from which is channelled into RDCs who manage R&D investments for their constituent industries.

However, there are a number of reasons why the levy arrangements on their own are unlikely to always encourage primary producers to invest in the socially optimal level of R&D — even where the direct benefits to producers would most likely exceed the costs. Possible explanations for this are:

- differences in the distribution of benefits across producers despite uniform levy contributions
- diffusion of R&D leading to rapid dissipation of benefits
- delays in the delivery of benefits from R&D
- the nature of levies as a production-based, rather than profits-based, revenue raising mechanism
- the likely ineffective role of levies where most (or all) of the benefits of the potential research projects would accrue to those who do not pay the levies.

### *R&D benefits distributed unevenly*

In principle, producers should be willing to pay levies that match the benefits they derive from the R&D that these levies collectively fund. However, the benefits from R&D are unlikely to be uniformly distributed.

To the extent that producers perceive that they may be relatively disadvantaged, in that their levy payments will benefit others more than themselves, collective funding arrangements will not entirely remove the incentive to try and free ride. Hence, levies might still be set below the level that would be optimal for an industry given the benefits potentially available from industry-focused research.

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There are several sources of potential disparity in the expected distribution of research benefits from levy payments.

- For industries that are geographically dispersed, the expected benefits are likely to vary across regions, even if there is a reasonably ‘balanced’ project portfolio — a point emphasised by several inquiry participants (WA Grains Group, sub. 61; Pastoralists and Graziers Association of WA and Western Graingrowers, sub. 115; Department of Agriculture and Food — WA, sub. 137; Department of Primary Industries, Parks, Water and Environment — Tasmania, sub. 148).
- Perceptions about the likely distribution of benefits between producers and processors may also affect the willingness of producers to contribute levies — especially as in most of Australia’s levy-paying industries, processors are not required to contribute.

Furthermore, there is likely to be a wide range of views among producers regarding the appropriate research balance. Large and innovative producers, with resources to invest in private extension services, may wish to see greater focus on longer-term, ‘blue sky’ projects. Conversely, smaller and/or less innovative producers may prefer an emphasis on less risky short-term research, with a heavier extension component. Depending on their perceptions about the sort of R&D that will actually be funded, not all producers will see their needs as always being well met, which may in turn be reflected in how they vote on levy rates.

### *Rapid dissipation of benefits*

A related reason why producers may vote to set levies at sub-optimal levels is that the benefits from R&D may swiftly ‘pass through’ the system. As noted in section 3.2, the less time it takes for competitors to appropriate the benefits of one producer’s R&D, the lower the benefits to that producer. The same is also true in a collective sense if competition drives down prices rapidly. That is, if producers collectively perceive that most of the benefits from their levies are likely to be appropriated by consumers, their willingness to pay levies may be reduced.

This ‘problem’ exists in the absence of any levy arrangement. However, levies — which, by design, provide for common pooling of R&D efforts — will tend to increase the rate of dissipation. This is because, where research outcomes are equally available to all levy payers, no single producer enjoys any short-term monopoly. Rather, all levy payers are notionally provided with the same potential ‘advantage’, allowing for price adjustments to be passed through to consumers more quickly.

That said, the levy arrangements are in place because free riding presents a worse outcome. Indeed, even if the benefits rapidly pass through the system (ultimately to

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consumers), producers will still generally be better off than if they had not invested in R&D. At a worst case, ‘standing still’ is better than going backwards, relative to producers of substitute goods or foreign competitors who may be investing in R&D.

Even so, where pass-through of benefits to consumers is expected to be rapid, such considerations may not be sufficient to motivate producers to vote for appropriate levy rates. In particular, the role that R&D has played in enhancing the competitiveness of overseas suppliers and competing products may not always be easy to discern.

*Invest today, possibly benefit tomorrow*

In direct contrast to the prospect of benefits being quickly passed through to consumers, a commonly stated reason that levies might be set at sub-optimal levels is that the benefits from R&D tend to accrue over time, with large upfront investments not delivering benefits for many years. (Although levy imperfection arguments centred on lengthy adoption lags are not automatically inconsistent with the rapid dissipation of benefits argument, no single R&D project can exhibit both properties. Plainly, if producers are slow to adopt new innovations, this also means that benefits will not be quickly competed away.)

Alston, Pardey and Ruttan (2008) estimated that the lag associated with developing new crop varieties can be 5 to 10 years, with further lags in commercial adoption by producers. They concluded that the benefits from R&D might not peak until 15–25 years after the initial investment is made — and the lags may potentially be even longer in some areas.

From a project investment perspective, such lags are addressed through the discounting of future benefits (a standard practice in project evaluation). However, the *average* industry-wide expected benefit might not realistically represent the benefit for an individual producer — especially if he/she planned to retire from the industry before those benefits fully materialised. As Meat and Livestock Australia (sub. 106) observed, with the median age of a farmer approaching 60, most will no longer be working the land by the time that any commercial applications emerge from much of the R&D being commenced today.

The expected future benefit could still be appropriated by a retiring farmer if he or she sold the business. But it is questionable how accurately the sale price (or bequest value, if the farm were transferred to a family member) would capitalise the expected future benefits of the R&D concerned, especially given time lags and the consequent uncertainties involved. Moreover, any given farmer’s discount rate could be considerably higher than the industry average.



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### *A levy on production, not profits*

A further consideration in examining the extent to which levies will address potential under-investment in rural R&D is that levies are not collected on profits, but rather on a variety of other (commonly output-related) bases. This means that rural producers are still liable to pay levies even when they are making a loss. As the Pastoralists and Graziers Association of WA observed, levy contributions are ‘not a small contribution from a farming business’ (sub. 115, p. 3). In any given year, levy payments can have a notable effect on a producer’s profitability.

Of itself, the need to pay levies in non-profitable years should not unduly influence the levy rates voted for by most producers (other than perhaps those perennially in the low-income category). While the levy may be a significant additional burden in years of poor profitability, in the good years it may represent a relatively small price to pay for the benefits that result from R&D.

However, relative to many other parts of the economy, producer incomes can be very volatile. As the Grains RDC argued:

Growers’ income streams are highly volatile since revenue is dependent on yields and profits, which in turn depend on unpredictable external factors such as rainfall, climate variability, outbreaks of pests, exchange rates and world prices for grains. (sub. 129, p. 3)

Hence, levy payments — which in the short term are effectively fixed (chapter 9) — can also fluctuate considerably as a proportion of cash income. By way of illustration, in a ‘typical’ year for the dairy industry, farmers spend 1.5 to 3.5 per cent of their cash income on levy payments. However, in 2006-07, dairy farmers paid (on average) 11 per cent of their cash income in levies. Similarly, while, on average, less than 1 per cent of canegrowers’ cash income was expended on levies in 2005-06 and 2006-07, in 2007-08 this proportion increased to 9 per cent due to a combination of falling sugar prices and higher input costs (table 3.1).

**Table 3.1 Volatility in the proportion of income paid as levies, per farm**

		Dairy industry					Sugar industry <sup>a</sup>		
Average		2004-5	2005-6	2006-7	2007-8	2008-9	2005-6	2006-7	2007-8
Levy payment	\$	2 337	2 815	2 520	2 112	1 831	550	592	604
Farm cash income <sup>b</sup>	\$	80 417	85 440	22 321	130 261	78 788	67 285	93 581	6 763
<b>Levy payment ÷ farm cash income</b>	%	<b>2.9</b>	<b>3.3</b>	<b>11.3</b>	<b>1.6</b>	<b>2.3</b>	<b>0.8</b>	<b>0.6</b>	<b>8.9</b>

<sup>a</sup> Canegrowers only. <sup>b</sup> Difference between total cash receipts and total cash costs (excluding capital and household expenditure).

Sources: Productivity Commission estimates based on ABARE (2010); Dairy Australia (2009); Hooper (2008); RDC annual reports.

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Such volatility, and the uncertainty it creates, may in turn lead to an excessive degree of caution in voting on levy rates, as these cannot be easily adjusted in response to changing circumstances. By way of contrast, individual entities investing privately in R&D can vary expenditures from year to year on the basis of capacity to pay, the internal availability of resources and other competing claims on those resources. Moreover, unlike many primary producers, larger individual entities often have diversified income sources, providing them with greater capacity to deal with a downturn in one aspect of the business, while continuing to fund R&D.

### *Wider research benefits*

The preceding discussion on levy imperfections has considered only circumstances where research benefits accrue within an industry. However, under-investment in rural R&D (from the community's point of view) can also arise where much of the benefit flows to parties *outside* the industry concerned (section 3.2). For instance, efforts to reduce greenhouse gas emissions from farming may have strong community benefits, even though any individual producer might have little to gain. Similarly, the costs to many woolgrowers of adopting alternatives to 'mulesing' sheep currently appear to be greater than any direct private benefits, although there is clear public concern about the practice.

As noted in section 3.1, it may be that community pressure or regulatory requirements will provide an incentive for the expenditure of levy funds to address adverse environmental impacts from rural activities or to improve animal welfare.

But such factors will frequently be insufficient to ensure an appropriate investment of levy funds in these areas, especially where the source of an environmental or social problem is difficult to ascertain (and therefore concerned members of the public are unable to identify precisely who is to blame).

Accordingly, it is likely that plenty of wider community benefits would go unrealised if only levy arrangements were employed to address spillover-related under-investment concerns. This point was identified by the Rural Industries RDC, in advocating public funding support:

In general, the argument for taxpayer funding relates to the benefits that may emerge outside a particular industry group, while the argument for other government actions (such as mandatory levies) relates to benefits within the industry. (sub. 92, p. 5)

Also, even where benefits are spread across several rural industries, levies will only be effective if there are good coordination mechanisms in place. Given producer myopia and other factors that may reduce the effectiveness of levies in a

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single-industry context, it would be naïve to assume this would always (or even generally) be the case. In short, while levies can be useful in promoting some forms of R&D — particularly those where the benefits are contained largely within a given industry — reliance on this instrument alone would see some socially desirable projects go unfunded.

## **Public funding**

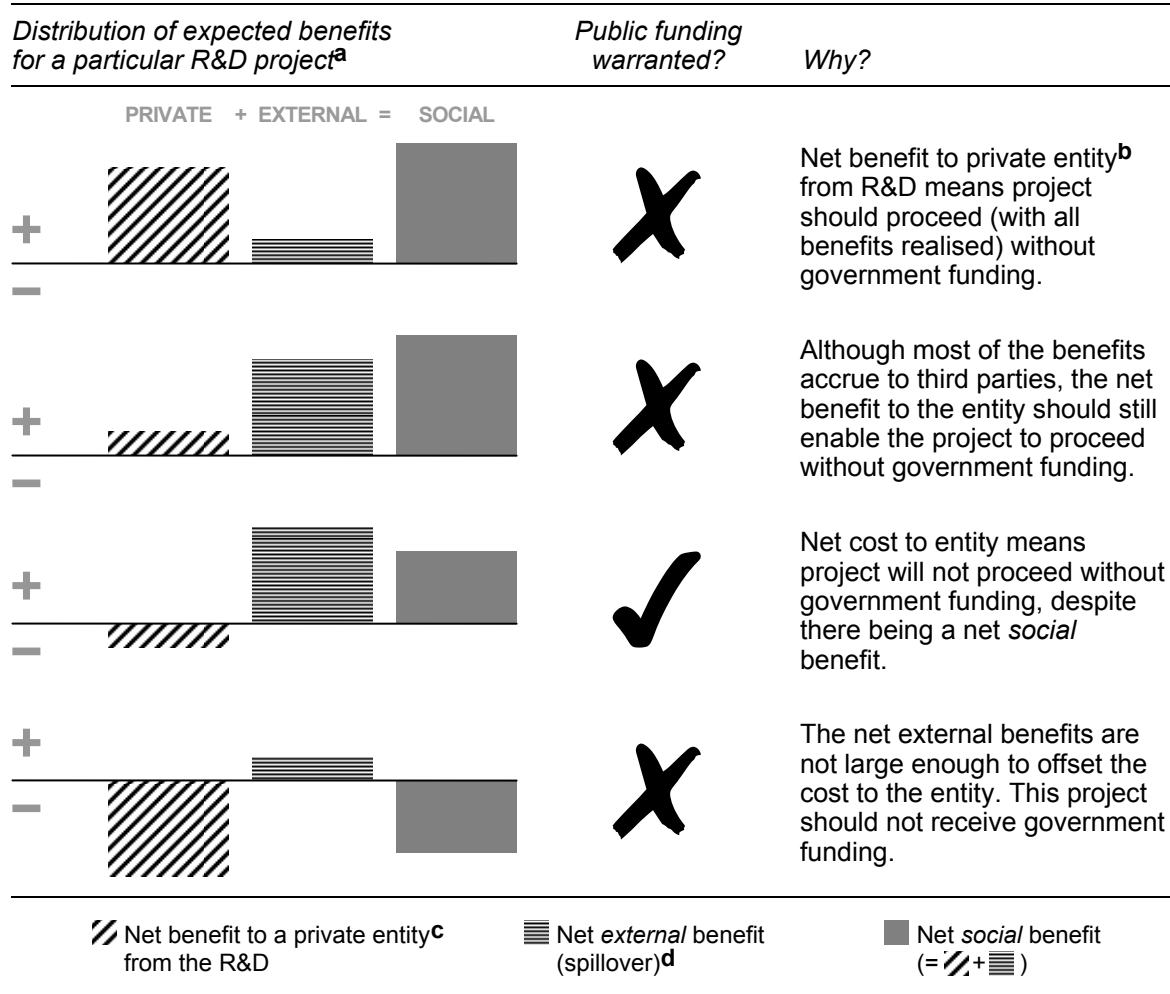
As the discussion above suggests, the ‘non-funding’ options available to government to promote rural R&D are unlikely to be sufficient to fully overcome spillover-related under-investment. Consequently, public investment is warranted in certain circumstances to help promote socially efficient outcomes.

Importantly, however, it is not simply the presence of spillover benefits that will justify funding support. If there are net benefits to those undertaking the research — including for levy-funded collective research — there should be no need for public funding. Spillovers are only relevant in a policy sense where the firm or industry faces a net cost, but the benefits accruing to the rest of the community from that R&D are sufficient to tip the social impacts into positive territory (figure 3.1). Put another way, to deliver ‘value for money’ in public expenditure, governments should seek to use funding contributions to induce socially valuable research that would otherwise not have occurred — that is, *additional* R&D.

## ***Additionality***

While the distinction between industry (‘private’) benefits and the spillovers that accrue to other parts of the community (the ‘public’ benefits) is clearly of relevance in this context, the principle of ‘additionality’ is not limited to the public–private dichotomy. As already discussed, imperfections and unavoidable limitations in the IP regime and levy arrangements mean that the presence of potentially significant industry benefits might still not be sufficient to ensure a project is pursued. Also, the line between private and public benefits is often vague. Most R&D outputs will lie somewhere along the public–private spectrum rather than at either extreme. As one manifestation of this, public funding might be used to deliver socially valuable projects earlier than would be justified purely on the consideration of private benefits (box 3.6). The key message here is that if socially valuable projects do not proceed, then even if the benefits are predominantly private, society is still worse off.

Figure 3.1 Spillovers from R&D do not always justify public funding



<sup>a</sup> Assumes for simplicity that the choice is between whether or not to invest, rather than how much to invest in a particular project stream. However, the same decision-making considerations would still apply for different permutations of the same broad project. <sup>b</sup> The private 'entity' may be an individual firm or the industry as a whole (with private funding in the latter case mobilised through a levy mechanism). <sup>c</sup> Expected net benefits to the private entity are not premised on the receipt of government funding support. Thus, they represent the expected private value of the investment, calculated by applying an appropriate discount rate to future (net) cash flows that reflects both the delayed benefit stream and the uncertainty that attaches to that benefit stream. <sup>d</sup> Includes the administrative and efficiency costs of government revenue raising.

Applying the concept of additionality — funding projects that would not otherwise be pursued — is complicated by imperfect information. As the Industry Commission (1995) identified:

... the government [has] to make a judgement about the amount and type of research any firm, or industry, would be willing to undertake .... This is clearly very difficult to do.

In practice, therefore, when governments subsidise industry research, they also subsidise research which would have been undertaken anyway. However, the expectation is that it will induce additional research, and, as a result, generate more worthwhile spillovers than would otherwise have occurred. (pp. 712–3)

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### Box 3.6      **Is ‘early’ R&D additional?**

As discussed in chapter 4, RDCs are required to consider additionality in their evaluation of R&D projects. However, the ways in which additionality are judged can vary. For example, in an evaluation report for one project, the Grape and Wine RDC (GWRDC) justified public funding because it would bring forward benefits that would otherwise not be realised for 5–10 years:

Whilst it was assumed that this technology would eventually have been developed without GWRDC investment ..., by bringing forward its development the GWRDC and industry investment will generate significant net benefits to the Australian community (i.e. estimated [net present value] of \$98m over 30 years). (EconSearch 2007, p. 15)

Such early introduction of R&D is not ‘additional’ in the normal sense of the term — it would have occurred anyway — but may nevertheless be justified. The relevant test is whether an earlier commencement would deliver net social benefits.

For instance, a business might not benefit from a particular project until it has exhausted its existing production capacity. If it were not expected to face capacity constraints for several years, it might delay R&D. However, benefits to the community from such a project (say, due to positive environmental spillovers) might emerge as soon as the outcomes were given practical application. If these spillover benefits were likely to outweigh the net costs faced by the business from earlier replacement of its capital, society could be better off if the R&D were pursued immediately. Thus, partial subsidisation of an R&D project (or an alternative form of government intervention, such as regulation) could be justified.

That said, bringing forward R&D is not guaranteed to be socially desirable. It risks promoting investments in resources that will be underutilised. Furthermore, the prospect of obtaining funding on such a basis could perversely lead firms to deliberately delay their R&D projects. Nonetheless, in looking at additionality, timing dimension issues may sometimes be important.

Consequently, some windfall gains to private parties are virtually inevitable where public funding support is provided for R&D.

Furthermore, if policymakers’ assessments of additionality are unduly stringent (driven, not unreasonably, by a desire to avoid wasting taxpayer dollars), socially desirable R&D can be neglected — the government might fail to invest in a project because it believed (erroneously) that the private sector would do so instead. Generally, this would be a worse outcome than funding research that would otherwise have proceeded.

But this does not mean that the additionality principle should be ignored. Doing so would — for the most part — lead to inferior outcomes, with little benefit for the community from its contribution (via government) to the cost of R&D to set against the costs of raising the revenue concerned.

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At the same time, while additionality should be a critical consideration when evaluating the case for funding rural (and indeed other forms of) R&D, its application requires a ‘common sense’ approach. Attempting to precisely estimate how much private investment would occur in the absence of government funding would likely impose a disproportionately large administrative burden. Instead, general ‘rules of thumb’ — including the traditional public–private distinction and long-term ‘blue sky’ research versus shorter-term adaptive R&D — may be suitable bases for approximating the likely additionality of rural R&D. These ‘implementation’ issues are discussed further in chapters 5 and 8.

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## 4 How well has the RDC model performed?

### Key points

- Various evidence suggests that R&D sponsored by the RDCs has been of significant overall benefit to both the rural sector and the wider community.
- As a vehicle for planning, funding and delivering rural R&D, the RDC model has important strengths, namely:
  - strong linkages with industry that promote soundly based investment decisions and greater or faster adoption of the resulting research outputs
  - the capacity to perform a systems integrating role across the broader framework, leading to, amongst other things, less duplication of research effort
  - accumulated expertise in brokering and managing research and flexibility in choosing the most appropriate basis for allocating research funding.
- However, it does not automatically follow that the community has received the best return on the government contribution towards the cost of research sponsored by the RDCs. In particular, a range of considerations collectively suggest that, in an overall sense, *and with a levy system in place*, the degree of additional research induced by government funding has been modest.
  - Much of the research has been focused on improving on-farm productivity, or otherwise directly benefiting the industries concerned.
  - High estimated benefit–cost ratios for many RDC projects — and often within a relatively short period of time — reinforce the notion that the incentives for private investment in such research would have been strong.
  - So too does the fact that some primary producers pay additional voluntary levies that are not matched by government funding.
  - The abolition of Land and Water Australia removed public funding from the main area of the RDC program where such funding was most likely to have induced significant additional research activity.
- Put another way, it is seemingly the levy system, rather than the contributions from the Australian Government, that is doing most of the work in addressing the potential for under-investment in socially valuable rural R&D.

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As discussed in chapter 3, soundly based rural research and development (R&D) has various benefits, including enhancing the productivity and competitiveness of the rural sector and contributing to better environmental and social outcomes. Given their pivotal role within Australia's rural R&D framework, the investments made by the Rural Research and Development Corporations (RDCs) are clearly very important in this context.

As part of a broader framework, the contribution made by the RDCs cannot be assessed in isolation. Thus, the capacity of the RDCs to operate as systems integrators is a key strength of the model (see below). Moreover, given the alternative vehicles available to fund rural R&D, the strengths and weaknesses of the model must ultimately be judged relative to these alternatives.

Perhaps most importantly, from a public policy perspective, the key issue in assessing the performance of the RDC model is the extent to which the Government's funding contribution has induced additional, socially valuable, rural R&D. As discussed in chapter 3, where public funding is supporting R&D that primary producers would have had sound financial reasons to fund themselves, then the public contribution may add little value for the community, even if the research itself has significant productivity or other benefits.

With these considerations in mind, this chapter discusses the performance of the RDC model, with a view to providing a platform for the subsequent assessments of whether the model should be retained, and if so, how it might be amended to increase its efficiency and effectiveness.

## **4.1 The benefits from RDC research**

Submissions to the inquiry from the RDCs, industry groups and individual primary producers, provided extensive examples of the benefits that have ensued from RDC sponsored research. While many of these reported benefits have taken the form of savings in producers' input costs or other sources of productivity improvement, such as higher yields or more efficient farming practices, some of the research has also contributed to better environmental and social outcomes (see box 4.1).

As a basis for more rigorous estimation of the benefits from rural R&D, many submissions referred to the results of benefit–cost studies and, in particular, to the evaluation of the returns to the RDC research portfolio coordinated by the Council of Rural Research and Development Corporations (CRRDC 2010).



## Box 4.1      **Examples of benefits from R&D sponsored by the RDCs**

### **Productivity and competitiveness**

[The use of] genetics in the *Lamb Plan Program* [has delivered] a product that better suits customer needs [and] has led to large increases in the profitability to prime lamb producers across Australia. (Victorian Farmers' Federation — Livestock Group, sub. 27, p. 7)

... as a result of ... ground breaking research [by Horticulture Australian Limited] our pecan farming operation has been pesticide free since that time and has supported research, extension and commercialisation programs for the control of our own pest species as well as work in macadamias, cotton, and citrus. (Stahmann Farm Enterprises, sub. 23, p. 1)

A suite of research, development and extension projects funded [by the Fisheries RDC] for Western Rocklobster ... resulted in a best practice code for handling product for the industry. ... now 95 per cent of all lobster are landed live and in good condition. This lifted the [yield] ... by at least 4 per cent ... and has added nearly \$15 million of pure profit to the industry every year. (Western Australian Fishing Industry Council, sub. 141, p. 6).

... [Rural Industries RDC] provided the essential groundwork in [coffee] variety selection and the development of management systems to suit machine harvesting and the Australian environment. ... Without the initial and continuing support from RIRDC for essential R&D, the coffee industry would not have developed as quickly or as professionally. (Peasley Horticultural Services, sub. 13, p. 3)

... Australia's cereal industry has been able to maintain its competitiveness by the adoption of new varieties; many have been funded directly or indirectly by RDCs such as the Grains RDC. (Australian Centre for Plant Functional Genomics, sub. 15, p. 2)

[The Cotton RDC] has made a significant investment in the implementation and adaptation of transgenic cotton traits in Australia since the first introductions in the mid 1990s. ... CRDC research has enabled Australian growers to rapidly achieve the benefits of these global technologies and remain internationally competitive while ensuring a robust pre-emptive resistance management and monitoring strategy exists. (Cotton Australia, sub. 68, p. 16)

### **Environmental and social benefits**

... whilst difficult to quantify, the environmental research undertaken by the [RDCs] has not only meant that Australian feedlots are world leaders in environmental management, but that its benefits are felt by both the industry and the wider public. Examples such as emissions abatement and the development of sustainable application rates for the use of manure and effluent as a soil conditioner readily come to mind. (Australian Lot Feeders' Association, sub. 19, p. 8).

CRDC investments in integrated pest management and uptake of biotechnology R&D have been strong drivers of reduced pesticide use (over 80 per cent reductions in total applied active ingredient). This has resulted in improved environmental outcomes in cotton communities ... (Cotton Australia, sub. 68, p. 12)

The strength of public benefits from egg industry RD&E can be found in [Australian Egg Corporation Limited's] research into the prevention and detection of Salmonella. An independent evaluation conducted by AgEconPlus Pty Ltd found that the benefits received by the Australian community through improved health outcomes associated with the Salmonella control cluster, on its own, has been sufficient to justify public investment in the total R&D portfolio. (Australian Egg Corporation Limited, sub. 119, p. 13)

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As discussed at length in the submission from the CRRDC (sub. 128, appendix 5), the results of the latest evaluation for a random sample of 59 projects indicated that for every \$1.00 invested in research by the RDCs, there was an average return of \$2.36 after five years, \$5.56 after 10 years and \$10.51 after 25 years.

For the reasons set out in chapter 3 and appendix B, the results of such evaluations must be treated with considerable caution. In the Commission's view, the estimated returns for some individual projects seem very high — especially were account to be taken of such factors as excluded RDC overhead costs, indirect government contributions resulting from marginal-cost pricing by government research suppliers, and the 'head start' provided by previous research, both in Australia and overseas. Further, in some of these evaluations, the assumptions relating to the extent and rapidity of adoption and the amount of additional spending required to facilitate such adoption, seem optimistic in the light of previous experience.

The Commission acknowledges that, for the most part, the benefit–cost estimates do not incorporate environmental and social benefits which have generally been handled qualitatively. Even so, such benefits appear to have primarily been a consequence of research designed in the first instance to reduce costs, increase productivity, or address concerns that would otherwise have undermined producers' 'community licence to operate'. The Commission further notes that there were some dissenting voices on the worth of parts of the RDC research portfolio. A synthesis and assessment of this commentary is reported in box 4.2.

However, such cautions and the existence of some dissatisfied stakeholders do not, in the Commission's view, call into question the validity of the widely held view that the research funded and managed by the RDCs has been of significant overall benefit to both the rural sector and the wider community. Indeed, such a conclusion should not be particularly controversial. Given the well demonstrated value of soundly based rural R&D, the implication of the opposite conclusion would be that for the past 20 years the RDCs have been fundamentally mismanaging the funds at their disposal. Like the overwhelming majority of participants, the Commission considers that this is evidently not the case.

That said, a conclusion that RDC sponsored research has provided a significant overall benefit for Australia does not necessarily imply that government contributions to the cost of that research has provided the best possible return to the community. As alluded to above, and discussed in section 4.3, this will depend on how much additional, socially valuable, R&D has been induced by the government contribution.

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#### Box 4.2      **Some dissenting views**

While the large majority of industry stakeholders endorsed the RDC model and the benefits of the research that it has funded, a handful of participants were less supportive. Most prominent amongst these were some Western Australian pastoral and grain growing entities (others to express significant concerns included the Australian Beef Association, subs. 154 and 162; David Lindsay, sub. 76; and the Queensland Murray Darling Basin Committee, sub. 52).

In arguing that the research sponsored by the Grains RDC (GRDC) has not delivered a benefit to grain growers commensurate with its cost, the Pastoralists and Graziers Association of Western Australia (PGA) and Western Graingrowers (sub. 115) contended that the financial gains from the increase in productivity in the sector since 1994 would not have been sufficient to cover the levies paid over this period.

However, as an indicator of the costs and benefits of the R&D concerned, there are several reasons why this sort of correlation is problematic. For instance:

- As noted in chapter 3, R&D is not the only influence on productivity growth. While accounting for the impact of productivity drivers such as farm consolidation and transport infrastructure improvements would worsen the claimed disparity between costs and benefits — a point made by Western Graingrowers — the correlation does not account for the impact of poor climatic conditions over much of the period in question. Notably, the recent sharp weather-related upswing in productivity in the rural sector (see appendix B) is not captured in the correlation.
- More importantly, in the absence of some of this R&D, it is unlikely that grain growers could have maintained their underlying productivity at 1994 levels. In particular, given changes in longer term climatic trends, average yields from the varieties available in 1994 would now most probably be lower. Hence, imputing the benefits for growers of the research funded by the GRDC through a simple comparison of current and past productivity levels, is likely to understate the actual benefits of R&D, possibly by a significant margin.
- Given the long adoption lags for some rural R&D technologies, part of the benefits from the R&D that has been undertaken by the GRDC may yet to be reflected in the productivity measures.
- R&D-related benefits for producers do not result solely from productivity improvements or cost reductions. For example, R&D that results in higher demand for farm outputs — for example, by increasing the attractiveness of the product or improving market access — can also provide significant income gains for producers.
- Some of the R&D concerned is also likely to have had wider environmental and social benefits which are not fully captured in on-farm productivity measures.

The upshot is that a set of case-specific project evaluations of the sort now being coordinated by the CRRDC is likely to provide a better (though still imperfect) guide to the benefits arising from the RDCs' activities than high level comparisons between levy payments and sector-wide productivity growth rates. The Commission further notes that not all grain growers in Western Australia share the concerns of the PGA and Western Graingrowers. Thus, while pointing to scope for improvements, the Grains Industry Association of Western Australia (sub. 143) expressed strong overall endorsement of the GRDC.

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## 4.2 Strengths of the RDC model

As a vehicle for planning, funding and delivering rural R&D, the RDC model has important strengths. In the first instance, these stem from the close linkages with industry that are inherent in the co-investment approach. These linkages can also promote greater or faster uptake of research outputs.

Further, as major players in the overall R&D framework, the RDCs have performed a broader coordinating function, with benefits extending beyond their immediate R&D activities. And while not solely attributable to the model as such, the RDCs have also accumulated and retained extensive staff expertise in procuring rural R&D. This could take considerable time to replicate in an alternative planning, funding and delivery mechanism.

### Benefits from industry and research supplier linkages

The RDC model establishes RDCs as an interface between industry, government and research providers, with both industry and government guiding research priorities. A range of formal and informal consultative structures help to ensure that those priorities are consistent with the research needs of primary producers. For example, beyond the prescribed industry consultation requirements (see chapter 2):

- The Grains RDC (GRDC) has established a system of regional panels covering the northern, southern and western grain growing regions of Australia. These panels are made up of grain growers, agribusiness practitioners, scientists and executives from the GRDC (sub. 129).
- Under the red meat industry memorandum of understanding, both LiveCorp and Meat and Livestock Australia (MLA) are required to obtain the formal approval of their respective peak councils for their strategic and annual operating plans (LiveCorp, sub. 57).

As well as helping to ensure that the research performed is relevant to the needs of industry stakeholders, such engagement, and the fact that industry is meeting around half of the cost of the research, can provide an important reality check on the overall worth of potential research projects. Thus, there is arguably less risk of investment in projects of low value to industry, or the community more broadly, than under arrangements where research is driven by the skills and interest of research suppliers, or managed by government departments more removed from the particular market environments concerned (see chapter 6). Indeed, an important objective in establishing the RDC model in the late 1980s was to bring a much stronger commercial focus to R&D investment decisions (chapter 2).

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Equally, in helping to guard against an excessively researcher-driven focus, the RDC model does not appear to have ignored the benefits that input from research suppliers can bring. Hence, consultation with suppliers has helped to ensure that, when formulating their research portfolios, the RDCs have kept abreast of relevant developments in knowledge, and have been cognisant of the capabilities and interests of those performing the research. In this regard, the University of Sydney suggested that:

One of the great strengths of the existing RDC model is that the RDCs tend to maintain much closer and more personal relationships with the researchers they fund compared with the larger government funding agencies. The RDCs generally act as effective ‘bridges’ between researchers and industry, ensuring that the research they fund is responsive, grounded, relevant, time and cost effective. Importantly, RDCs provide an effective avenue for ensuring that new knowledge that results from research, whether undertaken in Australia or elsewhere, is applied by producers to improve practices and outcomes. (sub. 53, p. 3)

The consultative linkages with industry, and the financial contribution that levy payers are making towards the cost of the R&D, are also seemingly valuable in increasing the level, or rate, of adoption of the resulting research outcomes. As noted by the Cotton RDC (sub. 114. p. 10) ‘the ownership that levy payers feel towards research outputs has been a key contributor to high adoption rates for research results’. As emphasised elsewhere in this report, effective adoption pathways are a critical requirement for productive investment in R&D. Without adoption, even potentially high-value R&D will be of limited tangible benefit to the community. Drawing on their linkages with the industries concerned, most of the RDCs are involved in supporting their R&D with extension and adoption services (see box 4.3).

The preceding general observations are not to suggest that the current processes for engaging with industry and research suppliers, or facilitating the adoption of research outputs, are problem free. As discussed in later chapters, various improvements in these areas were suggested by participants and by some of the RDCs. As also discussed later, the processes governing the interactions with the other key stakeholder, the Australian Government, can be improved.

However, in a general sense, the Commission sees the industry and other linkages inherent in the RDC model to be a strength that is highly relevant in comparing the model with alternative vehicles for providing government funding for rural R&D.

As the NSW Farmers Association observed, these linkages enable the RDCs:

... to prioritise, coordinate and integrate the demands of industry and government with the capabilities of research providers. This represents the translational research gap, and puts the RDC system in an ideal position to provide the link between research and industry and to bridge the gap between basic and applied research. (sub. 145, p. 10)

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### Box 4.3      **RDC involvement in extension activity**

Most of the RDCs provide extension services related to their research outputs. In many cases, these services are highly regarded. For example, the Queensland University of Technology said that the Sugar RDC:

... has played a pivotal role in developing the research, development and extension skills that support the whole sugar industry. Research projects develop the skills and careers of scientists, engineers and technologists who provide the extension services on which the competitiveness of the industry is based. (sub. 18, p. 2)

More broadly, the Winemakers Federation of Australia (sub. 21, p. 4) said ‘that one of the advantages of RDCs is that they fund research that is designed to be extended (and fund those extension programs), adopted and used for innovation.’ In fact, it appears that some RDCs have stepped in to fill part of the gap created by reduced State Government funding for extension services (see chapter 5), with an expectation from industry that this should continue to be the case. (See, for example, Apple and Pear Australia Limited, sub. 86; and the NSW Farmers Association, sub. 145.)

There were some critical comments on the RDCs’ role in extension, with several participants suggesting that not all RDCs have given sufficient attention to extension matters. (See, for example, AgriFood Skills Australia, sub. 99; Growcom, sub. 122; Irrigation Australia, sub. 90; and Nursery and Garden Australia, sub. 87). The Corporate Development Institute — informed by a series of surveys and interviews with producers and R&D providers — said that:

It is apparent that current engagement of RDCs in all elements of the current Extension, Adoption and Practice Change supply chain is variable as is the effectiveness of current ‘delivery processes’ to end users and beneficiaries. (sub. 151, p. 5)

Supporting this view, the CRRDC acknowledged that it had ‘identified that investment in extension and adoption may not have been pursued to its full extent across the RDCs and there is potential for more focused investment in this area’ (sub. 128, p. 73). More specifically, an independent evaluation of research sponsored by Forest and Wood Products Australia noted that budgetary constraints had precluded funding for extension-related activities and that this had impeded adoption rates (sub. 139, p. H.6).

However, such concerns seemingly arise from the specific manner in which the RDC model has been applied, rather than from the fundamental characteristics of the model. Thus, while there may well be scope for many of the RDCs to do more in the extension area, the Commission considers that the industry linkages in the model are better suited to promoting adoption of research outputs than some of the alternative funding and delivery approaches (see chapter 6).

## **The capacity to perform a systems integrating role**

As part of the process of setting research priorities and procuring R&D, a number of the RDCs play a ‘systems integrating’ role. This may variously involve:

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- collaborating with other research funders to undertake rural R&D of mutual benefit to each funder's stakeholders
  - using their significant financial resources to influence research priorities elsewhere in the system, including to prevent duplication of research and to help ensure that investments are of value to levy payers and the wider community. For instance, during informal discussions, several participants indicated that the involvement of, and a funding contribution from, an RDC, is effectively a requirement for any rural Cooperative Research Centre (CRC)
  - drawing on their expertise to influence the direction of framework reform — for example, through participation in the National Primary Industries RD&E Framework initiative and on various advisory bodies.

Various more specific examples of this systems integrating role were provided to the Commission. For instance:

- The RDCs provided extensive information on their collaborative R&D activities with both other RDCs and other research organisations (see box 4.4 and table 2.2). Indeed, the CRRDC emphasised that the RDCs are inherently collaborative entities, with around 80 per cent of their overall investment being part of a collaborative arrangement with at least one other RDC or non-RDC party (CRRDC, sub. 128).
- Horticulture Australia Limited has formal points of interaction with several Government agencies, including the Horticulture Export Advisory Committee, the Horticulture Market Access Committee, and the Regional Biosecurity Program (Horticulture Australia Limited, sub. 101).
- Australian Pork Limited has directors and managers who participate on the boards and committees of the Australian Biosecurity CRC and the Pork CRC, and is represented on a range of inter-organisation committees (Australian Pork Limited, sub. 117).
- The Fisheries RDC contributes to a network of Fisheries Research Advisory Bodies, with these bodies in turn undertaking R&D planning work relevant to their respective jurisdictions (CRRDC, sub. 128).

The Commission notes that, in a systems integrating context, the significance of the collaborative component of the RDCs' activities should not be overstated. Not surprisingly, given the need to cater for their industry stakeholders, much of this collaborative work has seemingly focused heavily on R&D with industry-specific objectives — a point noted by the CRRDC (sub. 128). Hence, as an integrator of more broadly based cross-sectoral rural R&D, the role of the RDCs has most probably been more limited.

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#### Box 4.4      **Examples of collaborative RDC investments**

In its submission to the inquiry, the Council of Rural Research and Development Corporations (sub. 128, pp. 102–123) provided details on a large number of collaborative RDC projects.

- *Managing Climate Variability* — a joint initiative between GRDC, Rural Industries RDC (RIRDC), Sugar RDC, Horticulture Australia Limited (HAL), Dairy Australia, and MLA. The program aims to help producers and natural resource managers deal with the risks, and exploit the opportunities arising from, Australia's variable and changing climate.
- *Premium Grains for Livestock* — an initiative funded and managed by the GRDC in collaboration with Australian Pork Limited (APL), MLA, RIRDC, Australian Egg Corporation Limited (AECL) and Ridley Corporation. The program aims to develop ways to increase the efficiency and effectiveness of livestock feeding programs.
- *Pastures Australia* — a joint initiative between Dairy Australia, GRDC, Australian Wool Innovation (AWI), MLA and RIRDC. The program aims to develop an efficient vehicle to invest in the development of new pasture varieties.
- *Animal Genetics* — a joint initiative between Dairy Australia, MLA and AWI. The project provides ongoing research and testing into DNA based technology for animal selection.
- *Reducing Nitrous Oxide Emissions from Pasture* — a joint initiative involving MLA, Dairy Australia, CSIRO, and other federal and state government agencies. The program is aimed at identifying technologies for producers to reduce greenhouse gas emissions.
- *Methane to Markets* — a joint initiative between MLA, APL, Dairy Australia, RIRDC and the Australian Lot Feeders' Association. This program is aimed at assessing the viability of capturing methane from manure for conversion into energy.

As noted in the text, around 80 per cent of overall RDC investment involves a cash or in-kind contribution from another RDC or a non-RDC party. However, these figures vary considerably across RDCs. For example, more than 40 per cent of investment by MLA, the Grape and Wine RDC and the AECL, involves no contribution from other entities (see table 2.2). Moreover, while some of the collaborative programs involve funding from broader government programs — such as the Climate Change Research Strategy for Primary Industries — much of the collaborative work still appears to have a strong industry focus.

Moreover, some participants observed that the pervasive influence of the RDCs on the wider system can have costs as well as benefits. The adverse consequences that can sometimes attach to leveraging of funding by the RDCs (see chapter 5), and the related potential for skewing of the overall rural R&D research portfolio too far in the direction of adaptive, shorter term research, are two relevant considerations here.



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However, perhaps most importantly, the capacity of the RDCs to operate as systems integrators is only partly a reflection of the unique position within the framework that the model affords them. It is also partly a reflection of the buying power and influence that attaches to the relatively large amount of funding that many RDCs have at their disposal. Were a quite different entity (public or private) to have similar funding at its disposal, and be able to readily redistribute that funding across research areas and/or suppliers, it too would almost certainly have a strong influence on wider research outcomes.

That said, the preceding observations are not to downplay the important systems integrating role that many of the RDCs have played, and their detailed understanding of the needs of their industries. Though not entirely a reflection of the RDC model, the design of the model has been a contributing factor to these beneficial outcomes.

Summarising this systems integrating role, MLA said that the RDCs are ‘uniquely positioned to facilitate, coordinate and optimise the complex interactions required at the level of their individual rural industry sectors’ (sub. 106, p. 66). Similarly, Barry White (sub. 59, p. 8), a former GRDC director and consultant to several RDCs, said that a key strength of the RDC model is ‘the capacity to consult more inclusively on issues and priorities across the entire system, and thus to help shape the priorities of the research providers.’

## **Expertise in the procurement and management of rural R&D**

The RDCs have developed considerable expertise in the procurement and management of rural R&D. In elaborating on these skills, the CRRDC (sub. 128, p. 14) said that ‘RDC staff have acquired substantial skills in assessing research proposals, negotiating research agreements, managing research performance, and overseeing extension and adoption plans’.

This view was generally supported by industry stakeholders. Indeed, the National Farmers’ Federation (sub. 109) contended that the skills of the RDCs in brokering research in technical areas do not exist elsewhere in industry or government. Similarly, the Western Australian Fishing Industry Council said ‘neither the Commonwealth Department of Agriculture, Fisheries and Forestry nor AusIndustry can deliver such RD&E investment with equivalent efficiency within the confines of the public service’ (sub. 141, p. 5).

Like several other rural R&D funding programs, the RDC model also allows for the use of competitive tendering processes to determine which research supplier(s) can deliver best value for money. But unlike programs that allocate all funding in this

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way, the model gives RDCs the discretion to decide when competitive tendering is likely to be beneficial. As elaborated on in chapter 5, competitive tendering arrangements can be administratively costly and not always effective in inducing good research outcomes. Especially where the track records of research suppliers are well known, tendering may therefore reduce, not enhance, the net benefit delivered by a particular project.

It is very difficult to quantify precisely how much these features of the RDC model have added to the ‘bottom line’ for the rural sector and the community. In particular, the impacts on the quality and timeliness of the R&D concerned are likely to be as, or more important, than the benefits from reducing project costs.

Also, while the expertise of the RDCs in procuring and managing rural R&D may help to constrain their administrative overheads, this will be only one of many influences on those overheads. In this regard, the nature and geographical dispersion of the industry in question, the volume of funds under management, the effectiveness of boards, executive remuneration policies, the location of head offices, and the extent of consultation involved in setting research priorities and communicating the results of that research, are all relevant considerations. Indeed, as Across Agriculture (sub. 116) observed, making changes to RDC practices on the basis of simple administrative cost to research expenditure ratios (see box 4.5) could lead to perverse outcomes:

... if for example, an organisation [were to seek to] improve its apparent efficiency by reducing the resources (and costs) associated with industry communication and extension. The end result could well be a very efficient research organisation that is very ineffective at getting industry to uptake the innovations and increase its productivity. (sub. 116, p. 69)

Hence, while comparisons of administrative overheads across RDCs may be a useful precursor to a more detailed investigation of whether observed differences are justified by particular circumstances, by themselves, they indicate little about the influence of the broad configuration of the RDC model on administrative efficiency.

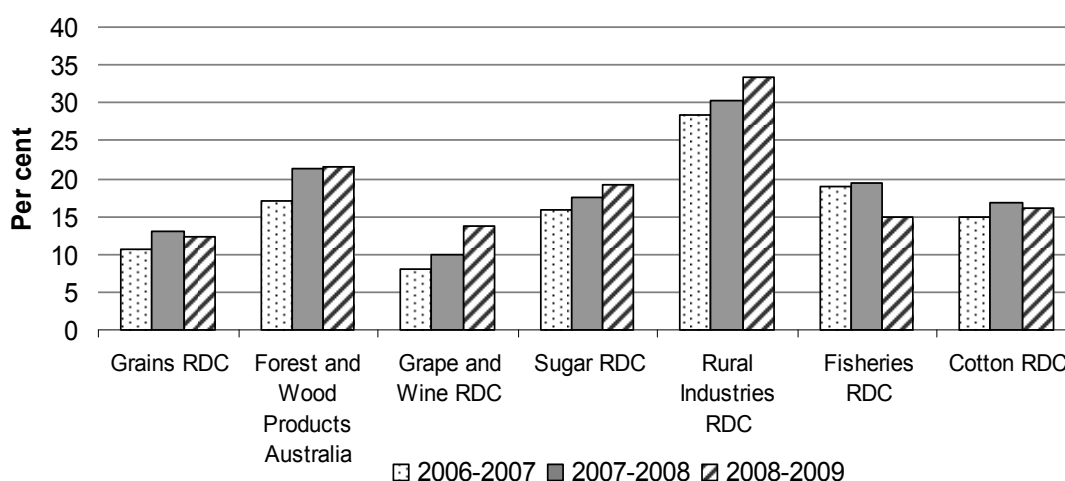
There is, however, one broad feature of the RDC model that may reduce the disciplines on efficient service delivery. With the Australian Government and industry bringing broadly equal funding to the table, responsibility for monitoring the performance of the RDCs is effectively divided equally between the two.

In these circumstances, and as alluded to in Frontier Economics (2006), each party may come to rely too heavily on the other to undertake this monitoring function — leading to less effective monitoring and management than would be the case if one of the parties was responsible for providing the bulk of the funding.

#### Box 4.5 Comparative RDC administrative overheads

Relying mainly on information available in the RDCs' annual reports, the Commission prepared estimates of R&D related administrative costs as a share of total expenditure for the six statutory RDCs and one industry owned RDC (see figure). Except for RIRDC, these cost shares fall broadly within the range of 10 to 20 per cent.

##### RDC administrative costs<sup>a</sup> as a share of total expenditure



<sup>a</sup> Includes all costs attributable to R&D activities for: employees; suppliers (including goods and services from external entities, operating lease rentals, levy collection fees); depreciation and amortisation; and other expenses (including write down and impairment of assets and losses from disposal of assets).

Sources: RDC annual reports and data provided by Forests and Wood Products Australia (for the years 2007-08 and 2008-09).

Differences in reporting methodologies precluded comparable administrative cost share estimates for the industry-owned RDCs (with an estimate for Forest and Wood Products Australia only possible because of the data legacy that remains from its operations as a statutory corporation prior to 2007). A particular issue in calculating cost shares for this group of RDCs is the allocation of corporate costs for entities that have marketing and in some cases industry representation functions as well as R&D funding and management responsibilities. Even so, information provided by some of the industry-owned RDCs suggests that the 10–20 per cent range is still broadly appropriate. For example, for 2009-10, Horticulture Australia Limited's estimate of R&D corporate expenditure as a share of total expenditure on R&D was around 13 per cent (Horticulture Australia Limited, pers. comm.).

However, as discussed in the text, such cost share estimates must be treated with great caution, especially given the diversity of industry consultation processes and other characteristics across the RDCs that will influence their costs of doing business. Also, the apparent costs shares can be heavily dependent on the methodologies used

(Continued next page)

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**Box 4.5** (continued)

to prepare estimates of this nature. By way of illustration, using the methodology preferred by RIRDC for allocating employee costs between administration and project-related research tasks (RIRDC, sub. 92), the administrative cost share for that entity in 2008-09 would be less than half the share reported in the figure above.

As a consequence, comparisons of administrative costs across the RDCs appear to be of limited value in an analytical context. Accordingly, beyond the broadly illustrative information provided in the figure above, the Commission is not intending to augment or refine this cost share material any further, or to seek to reconcile differences between the estimates in the figure and estimates provided by some of the RDCs. The most important issue is that the boards of each RDC are able to satisfy themselves and their levy payers that the overall cost structure of each RDC is reasonable in the context of the services provided to its stakeholders and the benefits of the research it sponsors.

However, the Commission does not consider this to be a fatal flaw in the model. The significance of any such impact is open to question and, in any event, the proposed rebalancing of funding responsibilities (chapter 7), would largely address any concerns of this nature.

More broadly, the Commission does not see the scope for improvement in administrative efficiency (see chapter 8) as detracting from the value of the expertise that has been accumulated by the RDCs in procuring and managing R&D. While such expertise is in some sense a reflection of the long history of the model, rather than its configuration, the flexibility available to RDCs to choose the most appropriate basis for allocating funding is a model-specific design advantage. Furthermore, expertise built up over a long period by the RDCs could not be replicated overnight. Thus, in a practical sense, that expertise (and the apparent ability of the RDCs to retain such expertise) is highly relevant in comparing the RDC model with alternative funding and delivery approaches.

### **4.3 The value of public investment in the RDCs**

As detailed in chapter 3, the primary rationale for the government to invest in rural R&D on behalf of the community dovetails from unpriced ‘spillover’ benefits to third parties that often attach to investment in R&D. However, as also noted in that chapter, such spillovers do not automatically justify a government funding contribution. Many projects that a private party would be willing to invest in without any contribution from government will generate spillover benefits for others in the community. Thus, the key rationale for government funding is to

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address instances where there are insufficient commercial incentives for private investment in socially valuable R&D — or in other words, where government funding will induce socially valuable R&D that would not otherwise have been undertaken.

In many respects, government concerns that the RDCs should be spending more on cross-sectoral research and less on farm-level, industry-specific, research are a reflection of this additionality concept. That said, cross-sectoral research may not always be additional either — in many sectors of the economy, consortia of private interests invest in research of mutual benefit. Also, as discussed in chapter 3, given imperfections in the levy system as a means to address free-rider problems, even highly industry-specific research assisted by a government funding contribution can be genuinely additional.

Such observations in turn illustrate the practical difficulties of precisely assessing what impact government funding for the RDCs has had on research outcomes. Significant judgement is involved in considering what part of the RDCs' research portfolio might have been privately funded absent the public contribution. Moreover, the degree of research additionality is likely to vary across both individual projects and individual RDCs.

However, in the Commission's view, a range of considerations collectively suggest that, in an overall sense, and with the levy system in place, the Government's funding contribution appears to have been of more limited value in buying additional research activity. Put another way, the Commission's judgement is that removing the ability to collect compulsory industry levies would have a much more significant impact on how much industry-specific rural R&D is carried out, than would a reduction in the Government's co-contribution.

### **The nature of research undertaken by the RDCs**

Much of the R&D sponsored by the RDCs is applied work ostensibly directed at increasing productivity or reducing primary producers' costs. Moreover, while some of the rural R&D undertaken in Australia is 'cutting edge', much of the domestic research sensibly focuses on the adaptation of knowledge, technologies and varieties developed overseas to meet particular local requirements.

The applied nature of much of research undertaken was acknowledged by a number of the RDCs (for example, Australian Pork Limited, sub. 117; Meat and Livestock Australia, sub. 106; and Rural Industries RDC, sub. 92). Also, the CRRDC has indicated in its sector-wide evaluation of the impact of the RDCs' investments, that most of the estimated benefits have been economic and mainly manifest in higher

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productivity, improved market outcomes and improved quality management (CRRDC 2010). Indeed, as indicated earlier, such a focus on research of direct benefit to levy payers should not be particularly surprising.

The Commission notes that data submitted by the Department of Agriculture Fisheries and Forestry (sub. 156, p. 44) on RDC expenditures against each of the rural R&D priorities, suggest that less than half were directed at ‘promoting and maintaining good [industry] health’. However, when expenditure directed to ‘frontier technologies for building and transforming Australian industries’ is added to this figure, the share of ‘industry-focused’ R&D increases to more than 70 per cent. Moreover, as alluded to earlier, research directed at environmental and biosecurity priorities — the balance of expenditure in the Department of Agriculture Fisheries and Forestry expenditure categorisation — can still have the effect of directly benefiting the industry concerned. Hence, in the Commission’s view, the data do not fundamentally contradict other evidence that much of the RDCs’ research portfolio has been industry focused.

As noted earlier, industry-focused R&D supported by government funding can still be additional. However, *with a levy system in place*, such R&D is likely to have a lower degree of additionality in an overall sense than, for example, more broadly based research in areas such as climate change and land management, that may provide collectively large, but individually small, benefits to a wide spread of rural industries.

Lending further weight to the preceding observations are the specific assessments of additionality in the sector-wide evaluations of the RDC research portfolio. In the most recent evaluations, roughly half of the individual program evaluations explicitly addressed additionality. Of these, around 80 per cent concluded that the program would still have proceeded without government funding (box 4.6). Indeed, only one of this subset of evaluations concluded that a program would definitely not have proceeded without the government contribution.

It is true that those same evaluations indicated that absent the government contribution, the research program might have proceeded at a slower rate, or been narrower in scope. At any point in time, this would almost certainly be the case — given the cumbersome nature of the levy change process (see chapter 9), government funding would be difficult to immediately replace. However, over the longer term, the acknowledged value of the research to the industries concerned would seemingly provide strong incentives for them to fill a possibly large part of the funding gap.

The Commission further notes that it would be very surprising if any of these evaluation reports had indicated that government funding was not necessary for

program viability. Even if not providing significant additional benefits for the wider community, the government funding contribution is obviously highly beneficial for the recipient industries.

#### **Box 4.6 Discussion of additionality in recent project evaluations**

As noted in the text, around half of the program evaluations in the most recent sector-wide RDC evaluation exercise made mention of additionality matters. In only one case (the summer coarse grains breeding program) was it suggested that the program would have been unlikely to have proceeded in the absence of government funding:

...if the [Queensland Department of] Primary Industries and Fisheries/Grains RDC partnership in the cluster had not supported this program, it is highly unlikely that the private sector would have increased their investment in sorghum or maize breeding and maintained the same rate of progress in yields. (Agtrans Research, 2009a, p. 12)

The remaining evaluations indicated that programs would still likely have proceeded without government funding — albeit with narrower coverage and/or at a slower rate. Some specific extracts from these evaluations, or commentary on other research programs by the relevant RDCs, are reproduced below.

##### *Grain-related oilseeds breeding program*

Breeding programs are often perceived as the mainstay of productivity improvements for many crop species so that the investment would have been regarded as a high priority by levy payers. In the event that public funding were restricted, it is likely that most of the projects in the cluster would have still been funded by industry, assuming a levy system was still in place.

Most of the limited public spillovers that have been identified would therefore still have been delivered. If no public funding at all had been available, it is likely that the investment would have been curtailed to about 75 per cent of what GRDC actually funded. (Agtrans Research 2009b, p. 22).

##### *The chicken meat R&D program — Humane destruction of poultry*

If the chicken meat R&D program did not exist at all, this project would probably still have been funded as there was already significant funding from industry and other groups ... and any shortfall may have been able to be sought elsewhere. (RIRDC, 2009, p. 22)

##### *Egg research — Cannibalism control in layers project*

A levy without matching government funds may still have been sufficient to ensure the project was completed. Given the commercial nature of the outcomes from this research, i.e. additional production at a lower cost, this research might well have been completed in the absence of a public contribution. (sub. 119, p. 59)

##### *Avocado research*

In the event that public funding to [Horticulture Australia Limited] was restricted it is likely that most of the projects in the cluster would still have been funded by industry, assuming a levy system was still in place. ... If no public funding at all had been available for HAL it is likely that the investment would have been 50 per cent of the investment actually recorded. (AgEconPlus and Agtrans Research 2009, p.29, unpublished)

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## High benefit–cost ratios

The high estimated returns from many RDC sponsored projects (see section 4.1) reinforce the notion that, absent government funding, primary producers would have strong commercial incentives to fund this sort of research work. Importantly, these high estimated returns primarily reflect productivity improvements and other direct benefits to producers, as distinct from wider environmental and social benefits for the community.

As the Commission noted in section 4.1, there are reasons why the magnitude of these estimated returns may be overstated. However, even if the true returns were only a half or a quarter of the reported returns, with a levy in place to help address free rider problems, there would seemingly still be sound financial reasons for producers to fund much of the research concerned. This is especially the case as the evaluations indicate that there has often been, or will be, a worthwhile payoff from the research within a relatively short period of time (five years), even if the full return takes longer to materialise. This lessens the concern noted in chapter 3 that long lags between the conduct of research and the generation of benefits to producers will undermine the effectiveness of the levy system as a means to correct for under-investment.

## Additional private contributions

For a number of years, grain growers have paid a statutory levy that provides funding well in excess of the cap on the matching government contribution. Specifically, GRDC (sub. 129, p. 29) said that in recent years its funding mix ‘has demonstrated a 2:1 industry to government funding ratio’. The R&D component of the combined R&D and marketing levy for the wool industry also exceeds the cap on the Government’s matching contribution (chapter 2). In addition:

- as well as paying a statutory levy to help fund the Sugar RDC, sugarcane growers and millers pay a voluntary R&D levy to BSES Limited
- South Australian grain growers pay a voluntary R&D levy to the South Australian Grains Industry Trust.

Some other examples of private funding are provided in chapter 7 (box 7.2).

Such additional contributions — that presumably reflect the significant industry benefits from much of the R&D undertaken by the recipient bodies — again suggest that, absent government funding for the RDCs, private funding contributions would likely increase.



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The Commission further notes that many examples of private funding for rural R&D are apparent internationally. In New Zealand, the United Kingdom, Canada and the United States, organisations similar to the RDCs are primarily or exclusively funded by statutory or voluntary industry levies. For instance, in 2008-09, industry levies paid to Dairy New Zealand amounted to some NZ\$47 million — or about 80 per cent of that entity's revenue. Around a third of the levy revenue was spent on R&D (Dairy New Zealand 2009).

## **The abolition of Land and Water Australia**

Until the end of 2009, Land and Water Australia (LWA) sponsored a range of broader cross-sectoral rural R&D in areas such as natural resource management, climate change and biosecurity. This R&D was funded by a general appropriation from the Australian Government, with LWA then leveraging additional funding from various sources, including other rural R&D programs and other RDCs.

In an overall sense, the additionality attaching to public funding for the sort of research undertaken by LWA appears likely to have been significantly greater than for the rest of the RDC research portfolio. Accordingly, the abolition of LWA, and the accompanying reduction in public funding for research on 'national rural issues' sponsored by the Rural Industries RDC, almost certainly means that the Australian Government's overall funding contribution to the RDC program is buying less additional R&D than before.

## **Summing up**

The Commission reiterates that none of the preceding observations are individually definitive in regard to the degree of research additionality attaching to the Government's contribution to the RDCs. Collectively, however, the Commission's judgement is that they provide good reason to believe that the overall degree of additionality from that contribution has most probably been modest.

This does not mean that the research sponsored by the RDCs has been of limited value. To the contrary, without that investment, Australia's rural sector would almost certainly be much less productive and competitive. However, from a public funding perspective, it is the value added by the government contribution that is the key issue. For the reasons outlined above, much of the RDCs' current research program would most likely still proceed with less or even no government funding.

The Commission also emphasises that in concluding that the additionality attaching to the government contribution has most probably been modest across the RDC

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research portfolio as a whole, it is not suggesting that this is the case for every RDC. Apart from the aforementioned case of LWA, the government contribution to the Rural Industries RDC and the Fisheries RDC almost certainly buys more additional research than the contribution to most of the other RDCs — an outcome explicitly reflected in the general (non-matching) funding appropriation provided to these two entities. It would also be possible to find individual projects sponsored by almost any of the RDCs for which the government contribution was the primary driver.

Moreover, the Commission acknowledges that it is only relatively recently that the Government has been actively seeking to encourage the RDCs to invest in more broadly-based rural R&D. Research portfolios cannot be adjusted overnight and hence in the future it is possible that the government contribution will buy more additional, socially valuable, research. However, for the reasons set out in chapter 6, the Commission considers that the current configuration of the RDC model will likely militate against any significant increase in additionality. Accordingly, the Commission's judgement is that without changes to the configuration of the model, the degree of additionality attaching to the government contribution will most probably continue to be modest in an overall sense.

The Commission is not alone in drawing this conclusion. In 2006, in a discussion paper on the National Primary Industries RD&E framework, Frontier Economics commented that the system of rural R&D funding was characterised by a number of subsidies to private purchasers of research, with the risk of diversion of public resources into financing private gains. It went on to observe that:

One such subsidy can arise through the principle of matching co-financing through RDCs, if priorities determined by RDC boards are disproportionately influenced by private sector representatives. (Frontier Economics 2006, p. iv)

Similarly, in its submission to this inquiry, Western Graingrowers (sub. 115, p. 24) contended that 'as long as the levy is mandatory, free-rider concerns are addressed' and went on to suggest that in the absence of public funding 'private individuals, companies, or producers themselves (by pooling funds) will fund research'. Though disagreeing that mandatory levies completely address free-rider issues, the Commission concurs with the thrust of this comment.

## **4.4 Other design and implementation issues**

Beyond the high-level additionality concern, there are several more specific features of the current RDC model that may detract from its efficiency and effectiveness. Some of these relate to the broad design of the model, while others are a reflection

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of the ways in which the model has been given practical effect. While none are critical to the decision as to whether the RDC model should be retained, if the model is to continue, modifications to address such matters could help to deliver better value for money from the private and public funding involved. As discussed in chapter 8, particular issues that arise in this regard include whether:

- there would be benefit from greater high-level guidance on what should be expected from the RDCs in return for a public funding contribution and from the Government in its capacity as a key stakeholder in the model
- the current restrictions on the range of activities that can be undertaken by RDCs remain appropriate
- there would be benefit in reinstating ‘government directors’
- project evaluation and performance monitoring arrangements are sufficiently robust.

In addition, there are also changes that could be made to the levy arrangements that would make it easier for primary producers to increase their levy contributions and thereby increase their capacity to fund research of direct benefit to them (see chapter 9).

Finally, the Commission reiterates that the effectiveness of future RDC arrangements, or alternatives to them, will be influenced by settings within the broader framework. Accordingly, as a prelude to setting out its views on whether the RDC model should be retained, and if so, how it might be improved, the Commission has in the next chapter proposed a small number of changes that it considers would help to put the broader rural R&D framework on a sounder footing.



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## 5 Improving the broad framework

### Key points

- Australia's rural R&D policy framework should not seek to establish target levels for overall spending on rural R&D, or for the government share of that spending. Rather, the focus should be on ensuring that:
  - the framework is comprehensive and soundly based
  - available funds are spent wisely
  - public funding support is provided in ways likely to induce a commensurate amount of additional, socially valuable, research.
- The programs that make up the rural R&D framework should be premised on a consistent set of overarching public funding principles.
  - These principles should encompass the role of investment in rural R&D and the basis for government to contribute to its cost; the relationship of R&D policies with other policies intended to improve the productivity, social and environmental performance of the rural sector; and design features that are likely to enhance the efficiency and effectiveness of individual programs.
- In consultation with its State and Territory Government counterparts, the Department of Agriculture, Fisheries and Forestry (DAFF) should establish a process for assembling and maintaining robust data on funding for, and spending on, rural R&D in Australia.
- The Australian Government should establish a mechanism to coordinate its funding programs for rural R&D with a view to, amongst other things, addressing unhelpful inconsistencies, duplication and gaps that can arise from the spread of funding responsibilities across several departments.
- Other framework issues requiring further exploration include:
  - the balance between departmental and devolved program management
  - opportunities, within a contestable funding regime for government research suppliers, to reduce the scope for unproductive cost shifting
  - the scope to improve access to information on past research and to other critical building blocks for future rural research
  - how the role of the private sector in funding and delivering rural R&D can be enhanced, including through greater recognition of that role within the policy framework.

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The nature of Australia's rural sector and many of the challenges it faces are different from in the past. The domestic policy environment has also changed. Gone are most of the regulatory arrangements that shielded substantial parts of the sector from competition. Moreover, though governments continue to provide considerable financial support to the sector — including for research and development (R&D) — that support is now more heavily scrutinised to help ensure that it provides a benefit for the wider community as well.

Such changes have, in turn, had various impacts on the framework for funding, managing and delivering rural R&D and related extension services. For example, as outlined in earlier chapters:

- the relative importance of the main funders has been changing
- there are now dedicated research programs in place to address the implications of climate change
- through the National Primary Industries Research, Development and Extension (RD&E) Framework initiative, there is a concerted effort underway to rationalise fragmented rural research infrastructure and avoid unnecessary duplication of research effort
- there is increasing pressure on the Rural Research and Development Corporations (RDCs) to sponsor more cross-sectoral research as a condition for continued public funding support
- across the framework as a whole, the role of *ex post* evaluation as a means to both demonstrate the value of past R&D investments, and help shape the nature of future investments, is being increasingly recognised.

In many respects, such changes will simply improve on a framework that has many strengths. As the Cooperative Research Centre for Beef Genetic Technologies observed:

Although it has not had the financial resources of many of its international R&D competitors, Australia's Rural R&D system has invested wisely in selected, quite specific areas that were identified as offering greatest advantage to Australia and Australian agricultural industries. (sub. 62, p. 6)

At the same time, however, the framework is far from perfect. Indeed, as input to this inquiry illustrates, there is a widely held view that the rural sector and the community could get better value from the \$1.5 billion spent on rural R&D each year — and particularly from the more than \$1.1 billion provided by governments.

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In determining how far it should delve into broader framework issues in an inquiry focused in the first instance on the RDC arrangements, the Commission has faced some competing considerations.

On the one hand, the RDC arrangements both influence, and are influenced by, the broader framework. More generally, the input from inquiry participants has provided many ideas on how the framework might be improved.

On the other hand, the parallel reviews and processes currently in train — especially the National Primary Industries RD&E Framework initiative and the preparation of a National Strategic Rural R&D Investment Plan by the Rural R&D Council — constrain how far this inquiry could extend into broader framework issues without the risk of significant duplication of effort. Also, a sizeable part of government funding for rural R&D comes through programs which are not specific to the rural sector and which could therefore not be assessed solely, or even primarily, on the basis of their impacts within this one sector.

On balance, the Commission's judgement is that this inquiry can best add value by focusing on reforms to enhance the efficiency and effectiveness of the RDC model. Accordingly, in regard to broader framework matters, it has limited itself to:

- addressing the questions in the terms of reference about total funding for rural R&D
- setting out some high level principles that should underpin government funding programs for such research
- exploring a small number of specific framework issues that have been particularly germane to its assessments of the RDC arrangements.

## **5.1 Funding level issues**

Spurred on by a variety of empirical work looking at the benefits of rural R&D, the question of how much Australia should invest in such research, and by implication whether the current level of investment is too high or too low, continues to attract considerable attention. So too does the related question of how much of this funding should come from private parties and how much from the public purse.

However, as the following discussion makes clear, these are difficult questions to answer. More importantly, the answers are mainly useful in providing broad context for rural R&D policy rather than more specific guidance on matters such as appropriate public funding levels for particular rural R&D programs. Thus, hypothetically, a finding that there had been under-investment in rural R&D as a

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whole need not be incompatible with a finding that public funding for a specific program was too high.

## **The quantum**

There is an extensive body of empirical work on the benefits of investment in rural R&D (see chapter 3, appendix B and PC 2007). Notwithstanding a variety of data and methodological limitations, this work strongly suggests that, in aggregate, past investments in rural R&D have provided a significant payoff both in Australia and internationally. Based on this empirical work, and in the light of the challenges facing the rural sector, many participants argued that Australia should increase its spending on rural R&D (see box 5.1).

However, of itself, evidence of significant benefits from past investments in rural R&D provides relatively little guidance on whether Australia should be spending more or less in this area in the future. As Across Agriculture observed:

It is apparent from the extensive published research into the links between rural R&D and rural productivity growth that there are no firm ‘rules of thumb’ about how much rural R&D investment is required ... (sub. 116, p. 63)

What is conceptually most relevant to funding quantum questions are returns at the margin of the project portfolio — if returns on marginal projects are more than sufficient to justify investment, then *prima facie* additional funding (public and/or private) would be warranted.

In practice, identifying returns at the margin is very difficult. Given the uncertainties associated with investment in R&D, some projects expected to be of only modest value can in fact prove to be highly successful. Conversely, not all ‘sure fire winners’ subsequently live up to expectations. Marginality could be assessed on the basis of expected returns. But even then, construction of a ‘marginal’ project portfolio would require a very detailed and disaggregated assessment of overall rural R&D investment.

As several participants noted, aggregate returns from investment in rural R&D reported in recent studies are not greatly different from those in earlier studies — suggesting that returns at the margin have not been diminishing over time. A recent study by Sheng, Mullen and Zhao (2010) — which has been widely cited in submissions to this inquiry — suggests that a slowing in productivity growth in Australia’s broadacre rural industries in recent years can be partly attributed to a decline in (public) investment in rural R&D.



However, the Commission is very cautious about drawing strong policy conclusions on the appropriate level of spending on rural R&D on the basis of these sorts of observations and correlations.

**Box 5.1 Views on the quantum of funding for rural R&D**

The high cost–benefit returns from rural RD&E are a clear indicator that there is substantial under-investment and that rural RD&E investment in Australia should be significantly increased. (Council of Rural Research and Development Corporations, sub. 128, p. 48)

... the current quantum level of investment in primary industries innovation and R&D needs to be increased to deliver the economic, environmental and social outcomes expected by the industry and community and address the future challenges. (Department of Agriculture, Fisheries and Forestry, sub. 156, p. 50)

It is hard to suggest benchmarks for overall levels of funding except to suggest that current levels need to be maintained or increased as indicated by:

1) the correlation between reduced government spending in agricultural R&D and the decline in agricultural productivity growth ...

2) The absence of evidence of declining rates of return ...

(Industry and Investment NSW, sub. 69, pp. 15-16)

There is increasing evidence that the current overall level of funding allocated to rural R&D in Australia will not be sufficient to maintain or accelerate sector productivity growth rates, which will be required in order for businesses in the sector to remain internationally competitive, and also to meet future challenges such as climate change, climate change policy, water scarcity, and increased competition from developing nation agricultural exporters. (Across Agriculture, sub. 116, p. 9)

Given the ... need to maintain an efficient and productive agriculture sector, one would hope to see investment in R&D of close to 5% of the value of production. ... [T]his would translate to a public sector investment of around \$2.5 billion, well above current levels. (Australian Centre for Plant Functional Genomics, sub. 15, p. 4)

Given the significance of agriculture and other rural industries to Australia's economic wellbeing and long term security, we are of the view that levels of investment are too low. We are conscious that this is the rallying cry of many sectors in the economy, but the challenges [facing the sector], along with the changing nature of risk to society, place rural industries in a unique position within the innovation sector. There are few other significant sources of funding for the rural research sector. (University of Melbourne, sub. 50, p.3)

There is an increasing need for government to lift their spending on research and development in the rural sector. With increasing demands on the rural sector in areas including food production and land stewardship, government needs to increase investment in R&D to ensure that the greater community's needs are met. (Victorian Farmers' Federation Livestock Group, sub. 27, p. 6)

As is widely recognised, significant methodological difficulties attach to this work, including in regard to separating out the contributions of R&D and other drivers of productivity improvement (see chapter 3 and appendix B). After an exhaustive examination of the empirical work on the benefits of investment in R&D as a

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whole, the Commission (PC 2007, p. 186) concluded that the econometric evidence was too imprecise for calibrating funding levels.

More specifically, as elaborated on in appendix B, there are some significant unresolved issues relating to the aforementioned study by Sheng, Mullen and Zhao (2010).

- As noted in the study (p. 6), productivity trends for individual rural industries have not been uniform, with a decade of poor seasonal conditions further complicating assessments of these trends. Notably, productivity data compiled by the Commission for the rural sector as a whole (PC 2009) — as distinct from the broadacre industry subset considered by Sheng, Mullen and Zhao — suggest that the jury is still out on whether trend productivity growth has in fact slowed to any great extent.
- Likewise, the paucity of robust data on aggregate investment in rural R&D makes it difficult to categorically conclude that overall public funding has fallen significantly over the period covered by the study. Though aggregate funding from State and Territory Governments has almost certainly declined, the trend in funding from the Australian Government is less certain.
- Also, for the purposes of the R&D investment and productivity linkage investigated in the study, public and private funding would seem to be broadly interchangeable. Hence, even if public funding has fallen over the period, conclusions drawn without taking into account what has been happening to private funding could be erroneous. Again, the data deficiencies currently preclude such an assessment.

Another possible metric for assessing the adequacy of overall funding for rural R&D is to compare Australia's spending as a percentage of the value of rural output with the rural 'research intensity' in other developed countries. Here too data problems abound. Nonetheless, on the basis of the data that are available, Australia's research intensity does not seem to be widely out of kilter with international norms — especially given that countries such as the United States spend considerably more on ground-breaking research.

This is not to deny that some soundly based investments in rural R&D may have been delayed or precluded by funding constraints. In the coming years, there could also be a need to boost spending on system infrastructure, or to provide additional resources for extension (see section 5.4). Equally, on the basis of the evidence so far available to the Commission, it would be hard to sustain a case that Australia's overall spending on rural R&D is currently in the danger zone, or that the policy framework will be totally incapable of catering for emerging needs.

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Indeed, seeking to boost spending (public or private) on rural R&D without reference to specific research needs and outputs — or setting broad targets for research intensity — would be poor policy. For example, putting additional government money into under-performing programs, or providing incentives that made private investment in projects of low value appear to be worthwhile, would clearly be counterproductive, notwithstanding the fact that overall spending on rural R&D would likely increase.

Especially in the absence of robust data on total spending levels, the Commission considers that the key issue for the immediate future is how to facilitate best use of available public and private funds, and timely and effective funding responses to emerging needs. To the extent that efficiencies can be realised, addressing any unmet research needs will not necessarily require an increase in overall funding levels. More generally, if the policy framework is comprehensive and soundly based then it should, over the longer term, deliver a broadly appropriate level of R&D spending.

DRAFT FINDING 5.1

*It would not be appropriate to establish a target level for overall spending on rural R&D — nor a target for rural R&D intensity. Rather, the emphasis should be on ensuring that the policy framework is comprehensive and soundly based, and that settings within the framework facilitate efficient use of available public and private funding, and timely and effective funding responses to emerging needs.*

## **The public–private share**

As outlined in chapter 2, it appears that Australian governments fund some three-quarters of total domestic spending on rural R&D. Here again, past empirical work sheds little light on whether this share is appropriate. Much of it looks simply at the relationship between spending on rural R&D and productivity growth and does not distinguish between the source of funding. Also, as alluded to above, in studies that have looked explicitly at the impacts of changes in public funding, the reported outcomes have seemingly been driven by the consequences for total rural R&D spending, and not by any accompanying shifts in balance between public and private funding as such.

From a conceptual perspective, the appropriate overall balance between public and private funding will be dictated by how strongly the rationales for government to contribute to the cost of rural R&D apply to the various components of the framework. As discussed in chapter 3, these rationales relate primarily to spillovers from rural R&D that cannot be fully addressed through a combination of intellectual

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property protection and industry levy arrangements. However, to be effective in addressing such spillover problems, public funding must induce a reasonable amount of additional R&D. Otherwise, public funding will merely be replacing private funding — at some cost to the community because of the efficiency losses that attach to government revenue raising and/or the diversion of government resources away from areas that would provide a better return to the community.

Against these requirements, several considerations suggest that Australian Governments are collectively shouldering too much of the overall funding load.

- A significant component of public funding is used to support adaptive and industry-specific rural R&D that primary producers would have had sound financial reasons to fund themselves. For example, the Commission has concluded that across the RDC program as a whole, the level of additional research activity induced by the very significant Australian Government funding contribution has most probably been quite modest (see chapter 4).
- Government funding support for rural R&D is much more generous than in most other parts of the economy. For instance:
  - The government share of total R&D spending in Australia is a little over 40 per cent (PC 2007, p. 31) — around half the apparent share for the rural sector.
  - The level of Australian Government support for the RDC program is several times greater than the assistance provided through the general R&D tax concessions (see chapter 7).

Though the rural sector does have some distinguishing characteristics, as discussed in chapter 7, it is not sufficiently different to warrant disparities in public funding support of these magnitudes.

- The public funding share for rural R&D appears to be higher in Australia than in many other developed countries (see chapter 2). This is despite a heavier emphasis in Australia than in countries like the United States on adaptive research.

More generally, a significant component of the current rural R&D framework dates from an era when the basis for government intervention in the rural sector or elsewhere was less rigorously examined — and where legitimate rationales for such intervention were often conflated with more problematic justifications (such as infant industry arguments). In an environment where there is now much greater emphasis on requiring Australian producers to stand on their own feet, the efficacy of ‘legacy’ public funding regimes warrants particularly close scrutiny.

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That said, like an aggregate spending target, setting some sort of lower target share for governments' overall contribution to rural R&D, and then arbitrarily reducing funding support to move towards that target, would be a poor policy approach. Most obviously, it could lead to cuts in public funding for meritorious programs.

These considerations reinforce the case for focusing on whether it is possible to get better value from the existing suite of programs through which governments currently contribute funding for rural R&D, and whether there are any major gaps in the coverage of those programs. Such program assessment should in turn be informed by the Commission's proposed overarching public funding principles (see draft recommendation 5.1), with particular consideration given to whether the degree of additional R&D likely to be induced by the public contribution is broadly commensurate with the size of that contribution. This is the basis on which the Commission has put forward its suggested improvements to the RDC model (see chapters 6 to 8).

DRAFT FINDING 5.2

*Setting an indicative target for the share of total spending on rural R&D to be met by governments would be a blunt, and quite possibly counterproductive, approach. Rather, the appropriate share — and in turn the appropriate overall level of public funding — should 'emerge' from:*

- an assessment of all of the various programs through which governments currently contribute funding to rural R&D against the public funding principles spelt out in draft recommendation 5.1; having particular regard to the characteristics of the R&D conducted and thus the likelihood that public funding will induce a commensurate amount of additional, socially valuable, research*
- any evidence that the current program portfolio is failing to cater for particular types of socially valuable rural R&D that would meet the additionality requirement for public funding support.*

## **5.2 Public funding principles**

Premising government intervention on clear and soundly based principles, is a generally accepted component of best practice policy making. As well as giving consistent direction to those responsible for policy implementation and conditioning the expectations of stakeholders, such principles can also provide a benchmark for evaluating performance and thereby promote accountability for outcomes achieved.

At present, there is no overarching set of principles to guide government funding for rural R&D. The Commission considers that remedying this gap could be of

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considerable value. By way of illustration, the stated objectives of the *Primary Industries and Energy Research and Development Act 1989* (Cwlth) make no reference to how government funding for the RDCs can, and should, specifically contribute to a list of desired outcomes. Also, as the decision to abolish Land and Water Australia exemplifies, some past reductions in government funding have been heavily influenced by short term budgetary considerations as distinct from judgements about the fundamental merits of a public contribution towards the cost of the R&D concerned. More generally, introducing an overarching set of public funding principles would:

- help to reduce the potential for inconsistencies in approach across the multiplicity of individual funding programs
- provide a means to signal to the rural sector that government funding for R&D will not be made available on an unconditional basis. As the submissions to this inquiry illustrate, many in the sector are well aware that funding support comes with obligations and must ultimately benefit the wider community as well as primary producers. However, there is clearly still an entitlement mentality in parts of the sector. Notably, during its discussions in New Zealand, the Commission heard that an emphasis of rural R&D policy in that country has been on transitioning to a mindset of government funding support as being ‘a privilege not a right.’

## **The basis for government involvement**

### *Placing the role of rural R&D in context*

As discussed in earlier chapters, past investments in rural R&D — including by the RDCs — have contributed significantly to improving the productivity of Australia’s primary producers (as well as providing some wider environmental and social benefits).

That said, R&D is only one of a range of factors that have contributed to such improvements. As discussed in chapter 3, farm consolidation, enhancements to the Global Positioning System and other ‘non-rural’ information technology, improved agricultural machinery and chemicals, better transport infrastructure, and greater educational attainment within the rural workforce have all had a direct impact on productivity. More broadly, the dismantling of various trade barriers and other regulatory constraints on competition has greatly increased the incentives for primary producers to look for opportunities to improve their efficiency, including through investment in R&D. Also, as discussed elsewhere, Australia ‘imports’ a high proportion of its core rural R&D technologies and draws on genetic

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material/varieties developed in other countries. For a small country like Australia, this is a sensible strategy. Nonetheless, it means that a considerable portion of the productivity benefit from locally conducted R&D has ultimately been built upon overseas research effort.

The Commission's strong impression is that the contribution of factors other than domestic research to productivity growth is frequently ignored or understated in rural R&D policy setting. To the extent that this is the case, there is a risk that insufficient emphasis will be given to other policy options for improving the productivity of the rural sector such as continuing to look for opportunities to reduce barriers to competition and encourage sensible farm consolidation. Even worse, if investment in R&D (or other government assistance) were to be focused unduly on keeping uncompetitive primary producers in business, it could become an impediment to structural adjustment in the sector and detract from the effectiveness of other policies in place to facilitate change.

The same issues also arise for rural R&D aimed at delivering better environmental outcomes. Here again, R&D is only one of several options in the policy tool kit. In the Commission's view, it is particularly important that public investment in R&D does not deflect policy attention from exploration of instruments that would enhance the incentives (financial or otherwise) for primary producers to take account of any adverse impacts of their activities for the environment.

Ensuring that there is a conceptually sound basis for all rural R&D funding programs (see below) will go a long way to guarding against such problems. However, good outcomes are likely to be further facilitated by more explicit recognition in policy setting that:

- investment in R&D complements and augments, rather than supplants, other drivers of productivity and performance improvement
- R&D funding support should be consistent with other policies and programs designed to improve the economic, environmental and social performance of the rural sector.

#### *A focus on encouraging additional, socially valuable R&D*

As noted, the key rationale for public funding for rural R&D is to address spillovers and related market failures that would otherwise mean that socially valuable research would not proceed (or would be unreasonably delayed).

The Commission recognises that the additionality concept does not provide a precise basis for determining when and how much governments should contribute to

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the cost of rural R&D. Judging whether a particular project would proceed in the absence of public funding will often be very difficult.

Nonetheless, as a *starting point* for examining the case for public funding, the concept is more rigorous than the notions that are typically to the fore at present.

- Providing funding support simply on the basis that an investment in rural R&D is likely to provide a net benefit to the community removes any consideration of the distribution of that benefit between private parties and the wider community. At the extreme, this reasoning would justify public funding for any viable investment even if all of the benefits flow to private parties who would otherwise be prepared to meet the full cost.
- Targeting public funding support on socially valuable cross-sectoral projects, and/or those where the environmental and social benefits are a relatively large component of the total benefit stream, may often be a practical way of directing government funds into areas where they are most likely to add genuine value. However, such an approach does not obviate the need to look at additionality questions. For instance, there may be strong incentives for private parties to invest in R&D projects that provide large environmental or social benefits. Research directed at reducing on-farm water usage, or at addressing negative environmental or social impacts that undermine a producer's or an industry's 'community licence to operate', are two examples. Conversely, because the industry levy system will not fully address free-rider problems (see chapter 3), some research that benefits only the industry concerned, but which is nonetheless socially valuable, may not proceed without public funding support.

The Commission acknowledges that even where public funding for rural R&D does little to induce additional research activity, it may still be a better use of those funds than some other spending alternatives. In this context, the Queensland Farmers' Federation (sub. 112) contended that diverting public funding from 'Exceptional Circumstances' drought support to rural R&D would provide a net benefit for the community. However, if public funding for rural R&D were simply replacing private funding, then returning the government contribution to taxpayers would be even more beneficial.

Accordingly, in the Commission's view, the rural R&D framework should embed the concept of additionality in relation to public funding support — even if practical application of the concept relies on judgement. Indeed, additionality-related considerations are already brought to bear in the allocation of some public funding — including by certain RDCs (see, for example, Rural Industries RDC, sub. 92, p. 6) and the Victorian Department of Primary Industries through its 'distribution of benefits' investment considerations (sub. 161, p. 4). The Commission further notes



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that the additionality concept is embedded in the objects clause for the proposed new R&D tax incentives, which refers to R&D of benefit to the wider national economy that might not otherwise be conducted without a tax offset (Treasury 2010).

Giving effect to the principle that public funding support should seek to induce additional, socially valuable, R&D would in turn have implications for the role of the current rural research priorities (see chapter 2). Those priorities — modified as appropriate as circumstances change — would remain a vehicle for signalling desired outcomes from spending across the framework as a whole, and for shaping the mix of policy programs within the framework. However, where public funding was involved, the application of the priorities would need to also have regard to research additionality. The Commission further notes that a requirement to mesh the priorities with consideration of the likely additionality attaching to government funding in any particular situation would add to the more general arguments (see PC 2007, p. 370) against making the priorities more prescriptive.

## **Program and system design**

In its report on Public Support for Science and Innovation, the Commission (2007, chapters 9 and 10) mapped out a range of generic design requirements for R&D programs that can help to increase the benefits derived from the funding involved. As well as providing government funding in ways likely to induce additional, socially valuable, R&D, these requirements include:

- incentive structures and design features that encourage the efficient provision of quality research outputs — including through keeping administrative and compliance costs to a minimum, and promoting effective coordination across and within programs
- well defined adoption pathways that facilitate the uptake of research outputs by intended users
- governance, evaluation and reporting requirements that promote transparency in regard to intended and actual program outcomes, and that make those involved in procuring, managing and supplying R&D fully accountable for their performance
- in-built mechanisms to preclude double-dipping into the public purse.

In designing programs, there will often be tradeoffs between these sorts of requirements. For example, greater targeting of research additionality, or more stringent governance and evaluation requirements, will typically increase administrative costs. Similarly, while duplication of research effort will add to

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costs, up to a point, tackling a problem in more than one way can often lead to a superior research outcome. Nonetheless, in the Commission's view, such high level principles remain important starting points in the program design process.

As noted above, the Commission has not undertaken a comprehensive assessment of the overall rural R&D (and extension) framework, concentrating instead on the RDC arrangements. However, even a cursory assessment of the overall framework suggests that there is considerable scope for improvement in the design of individual programs — and more particularly in the way they come together as a funding and delivery regime.

### *Coordination issues*

As the RDC experience illustrates, there has been considerable collaboration and coordination between those procuring and supplying rural R&D. Indeed, as discussed in chapter 4, one of the strengths of the RDC model has been its system integrating role that has both fostered collaborative research work and helped to prevent unnecessary duplication of research effort.

However, the nature of such collaborative effort is sometimes driven more by a desire to access additional pools of government funding (see below), than by a concern to enhance the quality and relevance of the research concerned.

More broadly, with policy and program responsibilities split within and across levels of government, there is a considerable degree of compartmentalisation within the framework. Thus, in its submission to the Commission's 2007 study into Public Support for Science and Innovation, DAFF said that the difficulties of prioritising and coordinating activity across the framework had 'previously led to duplication in some areas and gaps in others' (PC 2007, p. 488). In a similar vein, in its submission to this inquiry, Irrigation Australia contended that:

... there is insufficient oversight of, and coordination and collaboration between, the different components of the framework. This is one of the major weaknesses in the current model and has significant implications for organisations like [Irrigation Australia] and researchers who seek to work across a range of commodities. (sub. 90, p. 10)

Also, while collaboration and funding linkages mean that the specific research sponsored by RDCs and counterpart Cooperative Research Centres (CRCs) is generally complementary, it is not clear to the Commission that the underlying research focus of the two programs is fundamentally different — a view seemingly shared by the CSIRO (sub. 123, p. 5) and the Department of Agriculture and Food Western Australia (sub. 137, p. 10). Thus, were the rural funding component of the

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CRC program to instead be provided to the RDCs, it is conceivable that the ensuing mix of R&D would not change greatly.

It is important that resources are not wasted in pushing together disjoint R&D activities in the name of coordination and collaboration. As one discussion participant told the Commission, collaboration and coordination can easily become ‘an easy “solution” for a government looking for a quick exit from a hard problem.’ Moreover, as discussed in section 5.3, the National Primary Industries RD&E Framework and National Strategic Rural R&D Investment Plan initiatives may well help to address current fragmentation problems.

That said, the capacity to better integrate decision making across the framework is significantly hampered by the lack of robust data on how much is being spent on rural R&D, who is providing the funding and where it is being spent. The collection and maintenance of much better data on funding and spending across the entirety of the framework is therefore a high priority. There also appears to be a need for a process — either as part of the aforementioned framework initiatives, or as an adjunct to them — to better coordinate government policy and program formulation, especially within the Australian Government. Some specific proposals to address these matters are set out in section 5.3.

### *Cost shifting concerns*

The multiplicity of funding sources for rural R&D provides considerable scope for those procuring R&D services to augment directly available funding with contributions from other sources. For example, the Council of Rural Research and Development Corporations (CRRDC; sub. 128, p. 58) reported that for the nine RDCs that were able to provide ‘leveraging ratios’, for every dollar each invested, an average of \$1.76 (mainly in an in-kind form) was contributed by other parties.

Of itself, such ‘leveraging’ is not a problem. Indeed, it may provide a means to: share costs and risks across the intended beneficiaries of an R&D project; cater for projects that would be too large for any one funding entity to sponsor; and draw in different sorts of scientific, financial and management expertise to enhance the quality and timeliness of a project.

However, the division of public funding responsibilities across and within levels of government, together with the indirect nature of some of this funding support, provides considerable incentive for the diversion of scientific and administrative resources into non value-adding cost shifting. Various examples of this sort of behaviour have been drawn to the Commission’s attention. For instance:

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- An RDC can make its funds stretch further by using its buying power to effectively appropriate all or much of the funding supplementation that universities receive when they perform commercial research work for (or in some cases collaboratively with) third parties. In these circumstances, the services are in effect provided to the RDC on a marginal cost basis, with the Australian Government indirectly picking up the tab for the balance of the project cost.
  - In a similar way, an RDC might be able to shift some costs by taking advantage of the need for CSIRO to supplement its block funding with a significant amount of revenue from contract research. In commenting on this matter, the CSIRO said that:

The co-investment/collaborative research model used by RDCs requires research providers to cover a considerable share of the costs of the research that the RDCs are purchasing. When Government funded research providers are performing ‘near to market’ research through RDCs they do not receive full industry funding. Thus, the rural producers are supplementing funding they have received from government by further leveraging public funds from research providers. ... It should not be the primary role of public sector R&D agencies to subsidise ... near-market research. (sub. 123, p. 25)

- As purchasers of rural R&D, in dealing with universities and the CSIRO, State Governments may also have scope to shift research costs back to the Australian Government. Conversely, in their capacity as research providers, they too may face pressures to provide services at less than full cost. Thus, the Dairy Futures CRC (sub. 78, p. 5) said that it obtained administrative services from State Governments (and Dairy Australia) on a marginal cost, or in-kind, basis.

Also, the scope for this sort of cost shifting may make it more difficult for research providers that do not receive government funding to compete for business. Hence, the Southern Tree Breeding Association — a not-for-profit research agency in the plantation forestry area — contended that the provision of services by government providers at less than full cost can:

... discourage participation by smaller (but efficient and innovative) service providers which may not have the muscle and resources of larger agencies such as CSIRO. ... Not funding reasonable administration and overheads of service providers is commercially unrealistic. (sub. 38, p. 2)

More generally, CSIRO contended that an emphasis on leveraging government funding by those procuring research can lead to an undue focus on:

... sector needs (often short-term) and can remove core public funding from the strategic research that it was intended to support, distorting the roles of research and development providers. This situation is exacerbated by funding not covering the full

costs of research and research infrastructure and ... can lead to the cross-subsidisation of research through other means. (sub. 123, p. 14)

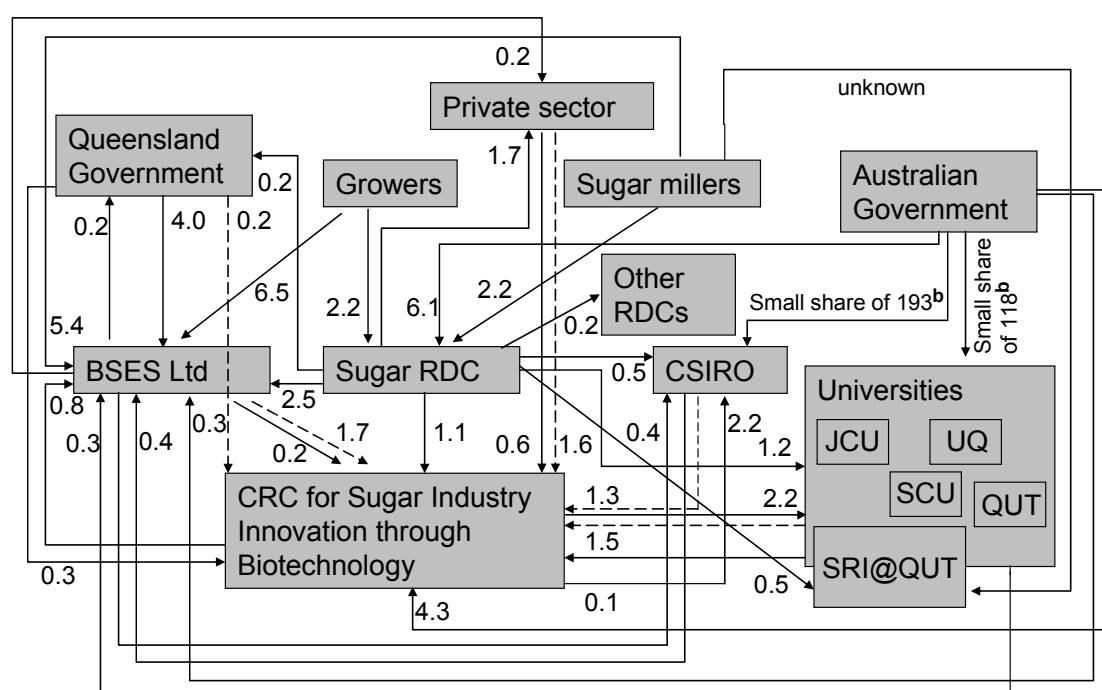
But even if cost shifting does not give rise to perverse or unintended outcomes, or is not particularly burdensome from an administrative point of view, it still makes it much harder to see what the various parties are actually contributing to the costs of projects (see box 5.2). Such lack of transparency makes effective monitoring and program evaluation considerably more difficult and may thereby indirectly reduce the incentives for efficient service delivery.

The scope to address cost shifting without sacrificing the benefits that come from exposing government research providers to competitive funding disciplines, or the need to seek commercial partners, is explored in section 5.4.

### Box 5.2 The complex 'money-go-round'

An important contributor to the difficulty of assembling robust data on overall funding and spending on rural R&D is the circulation of money within the system that results from the heavy emphasis on leveraging (and collaborative research effort). As a result, the same funding dollar can be recorded at several points in the delivery chain.

A example of the complex web of players and funding flows is shown below, for sugar industry research in 2008-09.<sup>a</sup>



<sup>a</sup> Funding for R&D, in millions of dollars. Dashed lines denote in-kind funding. <sup>b</sup> See table 2.1.

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### *Insufficient attention to adoption pathways*

No matter how intrinsically valuable a piece of rural R&D, if its outcomes do not result in changed practices, then beyond the knowledge generated, there will be no benefit from that research for the community. Thus, as the CRRDC emphasised:

Extension and adoption is a fundamental component of investment in rural research and development to ensure the translation of R&D to practical application along the supply chain. (sub. 128, p. 2)

Many of the concerns raised by participants in relation to adoption related to what they perceived to be an inappropriate reduction in State Government funding for extension services and the maintenance of related infrastructure. Typifying these concerns, Across Agriculture argued that:

It has been apparent for some years that the progressive downgrading of state government agricultural extension activities has longer term implications for the efficient operation of the Australian agricultural R&D system. ... [This] has placed added demands on ... RDCs [with] implications in terms of the availability of RDC resources for research activities. (sub. 116, p. 67)

However, in many respects, this concern is about who should pay for extension services. Though an important question, in the Commission's view, the more fundamental policy issue is ensuring that the adoption of research outputs is treated as an integral part of the R&D planning and delivery process. As discussed in chapter 4, this does not always appear to have been the case for research sponsored by the RDCs. Moreover, the Commission's strong impression is that for much of the rural R&D undertaken without the involvement of the RDCs and the industry linkages that this involvement brings, the attention given to adoption pathways has been less again. Drawing the same conclusion, AgriFood Skills Australia contended that:

One of the biggest challenges facing Australia's research bodies is how to speed up dissemination, adoption and adaptation of new knowledge at a grass roots level and to equip managers and employees with the skills to extract ideas from research in a practical manner, and that delivers strong economic returns. (sub. 99, p. 4)

Similarly, in commenting on the responses to its national survey on adoption and capacity building matters, undertaken in conjunction with the Corporate Development Institute and the CRC Association, the CRRDC said that:

It is apparent that the role of government agencies as partners is of great concern to the RD&E sector at large, with significant inconsistencies across state agencies. Clearly there are varied levels of focus, interest and ability in the extension, adoption and capacity building fields. Some issues are clearly sector-dependent; much of it concerns entire national RD&E segments. (sub. 128, p. 74)

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In elaborating on the survey results, the Corporate Development Institute (sub. 151, pp. 4–5) pointed specifically to a need for: governments to accept greater responsibility for facilitating adoption; stronger delivery mechanisms; better engagement by government researchers with agribusinesses in regard to research results; and more support for researchers to communicate their research outputs.

The current National Primary Industries RD&E Framework initiative may help to give higher priority to adoption issues. Nonetheless, the Commission considers that the importance of providing mechanisms and resources to facilitate the adoption of research outputs should be reflected in the overarching public funding principles that guide decision making across the framework. It further observes that better integration of adoption issues into the planning and delivery of rural R&D would necessarily require ongoing consideration of the adequacy of extension services and the case for a public funding contribution. However, as discussed in section 5.4, this would be in the context of the specific circumstances, rather than on the basis of some predetermined, across-the-board, notion of who should pay.

### *An embryonic evaluation culture*

As noted, the lack of data on funding and expenditure flows across the rural R&D framework is a significant impediment to effective evaluation at both the framework and program level. But even putting the data deficiencies to one side, historically, there does not appear to have been a strong evaluation culture permeating the totality of the framework.

This is seemingly a reflection of the fact that, until recently, the large amount of government funding for rural R&D came with few strings attached. Indeed, some discussion participants characterised this public contribution as an act of faith, underpinned only by the empirical work showing strong returns to rural R&D in aggregate; and periodic, similarly high level, program reviews. As such, there was relatively little onus placed on funding recipients to undertake the sort of more detailed case-specific evaluation that could have:

- provided better guidance on whether rural R&D funding, and in particular the very large public component, was being directed into the highest payoff areas
- highlighted means to improve service delivery and increase adoption, and thus boosted the pay-offs from research effort
- increased the accountability of those involved in the procurement, management and delivery process and thereby reinforced incentives for good performance.

While some publicly funded R&D entities did have robust project evaluation protocols in place, this was largely on a self-initiated basis. Others remained free to

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operate without the need to justify their government (or levy payer) funding or demonstrate a commitment to performance improvement.

However, with governments increasingly requiring public funding recipients to demonstrate that the community has received an appropriate benefit from its investment, attitudes to evaluation are changing. This is exemplified by the program-wide evaluation process initiated in 2007 by the CRRDC and its more recent initiatives to help promote best practice evaluation across the rural R&D framework as a whole (see chapter 8).

That said, the interest of governments in more robust evaluation appears to have been at least partly motivated by the quest for short-term budgetary savings — potentially leading to the use of evaluation by funding recipients as a defensive rather than a proactive tool. (This may help to explain why average reported benefit–cost ratios seem to be very high.)

Here again, the Commission considers that robust project evaluation — before as well as after the event — must now be entrenched as an integral and positive part of the rural R&D framework. Beyond incorporation in the Commission’s proposed new high level public funding principles (see below), the National Primary Industries RD&E Framework and National Strategic Rural R&D Investment Plan initiatives would be two obvious vehicles for doing so.

### *Research balance issues*

A perennial and complex issue for rural R&D policy making is whether the overall research balance is appropriate to meet the current and future needs of the sector and the wider community. Inevitably, views on this matter will differ.

As noted earlier, Australia’s focus on adapting overseas technologies to meet local requirements is a sensible one. Nonetheless, at the margin, there is still the question of whether Australia is doing sufficient basic, larger-scale, higher-risk, rural research.

- Adaption of overseas technologies must be built on a platform of basic knowledge and skills.
- Gaining continued and timely access to those technologies may require Australia to demonstrate that it is making some contribution at the more basic end of the research spectrum.
- Too heavy a focus on small scale, low risk, R&D may both remove any possibility of quantum leaps in performance improvement and greatly reduce the likely research additionality attaching to the public funding contribution.



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In commenting on research balance issues, the Department of Industry and Investment NSW (sub. 69, p. 13) suggested that the reported 30 per cent share of aggregate RDC spending invested in projects classified as ‘strategic’ is broadly in line with the ‘optimum’ level suggested by a previous empirical study (Pannell 1999). However, several participants contended that Australia’s overall rural R&D spending, or spending within particular programs, is too heavily oriented towards adaptive research in particular. (See, for example, John Karlsson, sub. 20; Australian Biosecurity Cooperative Research Centre, sub. 29; WoolProducers Australia, sub. 48; Queensland Government, sub. 153.)

In an inquiry focused on the RDC arrangements, the Commission has not undertaken the sort of analysis that would allow it to come to definitive judgements on whether the research balance across the framework as a whole is broadly appropriate — though in subsequent chapters, it has commented on research balance issues specific to the RDC program.

Even so, there are two particular areas where the Commission suspects that the current balance across the broad framework is not right.

First, there sometimes appears to be too much emphasis on attempting to preserve existing industry structures — rather than helping forward-looking and innovative primary producers and rural enterprises to enhance their intrinsic competitive strengths. For example:

- While the National Primary Industries RD&E Framework initiative seeks to consolidate funding and research delivery for each of its constituent streams, it is seemingly premised on retention of the current funding relativities between individual industry sectors. As discussed in box 5.3 later, it remains to be seen how easy it will be to adjust those funding relativities if the circumstances of particular industries change, or if new rural industries with pressing and potentially high-payoff research needs emerge.
- There are inherent pressures for RDCs to invest in a portfolio of projects that returns a benefit to all levy payers. One manifestation of this is the need for a degree of regional balance in RDC research portfolios (see chapter 9). However, it is also likely to require the RDCs to invest in projects that are explicitly directed at addressing the, often local and small-scale, issues of some levy payers, rather than simply targeting the more innovative producers and relying on demonstration effects to encourage uptake across the whole of an industry. Meeting this requirement without undesirably skewing the project mix may not always be easy — with the Australian Superfine Wool Growers Association (sub. 9, p. 35) observing that this has been a long-term issue of debate within the wool industry. The Department of Agriculture and Food Western Australia

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(sub. 137, p. 12) contended that the same pressures may also lead to spending on industry sub-sectors with limited future prospects.

Second, there appears to be merit in the argument that, even in an adaptive context, Australia is investing in too many small, short-term, low-risk, research projects. By way of illustration, Horticulture Australia Limited — the second largest RDC — reported that its average project size in 2009-10 was just \$77 000. Even with smaller projects such as ‘study tours, conferences and industry annual communications excluded’, the average project size was still only \$150 000 (sub. 101, p. 20). Certainly, in its discussions with New Zealand rural R&D entities, the Commission was struck by the seemingly much greater emphasis given to larger-scale, ‘game-changing’ research in that country.

With governments continuing to contribute a major component of funding for rural R&D, the key to achieving an appropriate research balance across the framework will be:

- clarity on what that public contribution is intended to deliver
- robust governance and evaluation requirements, and regular independent program reviews, to help ensure that for the R&D which is actually funded, the public contribution adds genuine value.

As discussed in chapter 8 in regard to the future RDC arrangements, research entities that invest exclusively or primarily in small-scale, low-risk, adaptive R&D, that primary producers would have sound financial reasons to fund themselves, should not expect to have this research supported by the taxpayer.

### **Implementing a set of overarching public funding principles**

Because policy and program responsibilities in the rural R&D area are shared between the Australian and State and Territory Governments, introduction of a set of overarching public funding principles to reflect the preceding considerations would need to occur on a cooperative basis. Accordingly, the Commission is proposing that, as a first step, the Australian Government embody the proposed high level guidance in all of its rural R&D policies and programs. Through the Primary Industries Ministerial Council (PIMC), the Australian Government should then seek the agreement of the States and Territories to do likewise, and also to import the principles into the National Primary Industries RD&E Framework initiative. The Commission further emphasises the importance of a concomitant commitment from governments to regularly review their programs and policies against the principles.

*The Australian Government should incorporate the following high level public funding principles in all of its rural R&D policies and funding programs.*

- *The primary aim of government funding is to enhance the productivity, competitiveness and social and environmental performance of the rural sector and the welfare of the wider community by inducing socially valuable R&D that would not otherwise be undertaken.*
- *Public funding programs for rural R&D should:*
  - *give appropriate recognition to non-R&D related drivers of performance improvement in the rural sector*
  - *facilitate, or at least not impede, structural adjustment in the sector*
  - *be consistent with other policies and programs designed to improve the performance of the sector.*
- *The design of individual funding programs should:*
  - *encourage the efficient delivery of quality research outputs, including through promoting effective intra- and inter-program coordination*
  - *build in appropriately resourced mechanisms to facilitate the adoption of worthwhile research outputs*
  - *promote transparency and accountability in regard to program outcomes through effective governance, evaluation and reporting requirements*
  - *promote transparency in funding flows and discourage leveraging behaviour that is administratively costly and/or designed solely to shift costs.*

*The Australian Government should further:*

- *commit to regular independent review of its various rural R&D programs against these principles*
- *through the Primary Industries Ministerial Council, seek the agreement of State and Territory Governments to incorporate the principles and the review requirement:*
  - *in all of their rural R&D policies and funding programs*
  - *in the National Primary Industries RD&E Framework initiative.*

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## 5.3 Specific framework initiatives

### Collecting better data on the framework

An important revelation from this inquiry has been the paucity of reliable data on what is happening across the totality of the rural R&D framework.

Of paramount concern is the absence of robust data on funding and spending flows within the framework. The most commonly cited estimates of total funding for rural R&D have been based on ABS data widely acknowledged to be imprecise in this particular context, with alternative estimates relying on equally problematic adjustments based on ‘informed guesses’. Data on the relative shares of total funding provided by governments and private parties are similarly imprecise and out of date, as is framework-wide data on the share of funding directed to each of the main R&D supplier groups.

Aided by input from participants, the Commission has made progress in unravelling the money trail to produce somewhat more robust estimates of overall funding flows (see chapter 2). Also, generally better data is available on the activities of the RDCs.

Nonetheless, this key part of the information base remains poor, compromising the effectiveness of policy making. As Across Agriculture commented:

The paucity of robust data about R&D funding, the types of R&D being carried out by different participants in the system, the nature and extent of private sector R&D investment, and how the funding and research activities have changed over time is a major weakness of the current system that makes it difficult for both industry and Government to make decisions about the adequacy of the Australian rural R&D system. (sub. 116, p. ix)

As the Commission’s own attempts to better document funding flows within the framework have highlighted, the assembly of such data is not easy.

- Many generally available R&D programs do not collate detailed data on the distribution of program spending on a sectoral basis.
- Data on private spending on rural R&D over and above contributions via industry levies is very limited, with estimates based on claims against the R&D tax concession missing an unknown amount of expenditure for which the concession cannot be, or is not, claimed (see section 6.2).
- Funding support that comes through ‘undercharging’ for research work by universities, CSIRO, and State Governments is effectively hidden.

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- The extensive leveraging of contributions from other parties means that there is considerable circulation of funding back and forth within the framework (see box 5.2 earlier). As well as reducing the transparency of the funding trail, this raises the spectre of double or even triple counting.

However, such difficulties are not an excuse for maintaining the status quo. While far from solving all of the funding riddle, the Commission's endeavours illustrate that there is ready scope for improvement in this area. Accordingly, the Commission considers that there should be a concerted push to build on the additional information on funding and spending across the framework that emerges from this inquiry, from the National Primary Industries RD&E Framework and National Strategic Rural R&D Investment Plan initiatives, and from initiatives being separately pursued by the CRRDC (sub. 128, p. 56).

Though requiring the input of State and Territory Government entities, such an exercise would most sensibly be undertaken at the national level — especially given the likely involvement of the Australian Bureau of Statistics. As Across Agriculture (sub. 116, p. ix) noted, the 'Current Research Information System' maintained by the US Department of Agriculture may provide guidance on how an Australian initiative might best proceed — though the Commission's understanding is that the US arrangements cover only publicly funded research, and are as much concerned with providing information about the research as about the amount of funding involved.

Finally, it is important to note that information on funding and spending flows is not the only deficiency in data relevant to assessing the performance of the rural R&D framework. In particular, there are widely acknowledged gaps in the information necessary for detailed project evaluation — including in regard to research uptake rates and the distribution of benefits across stakeholder groups. In the Commission's view, however, such data gaps will generally be best addressed through program-specific initiatives rather than on a framework-wide basis.

DRAFT RECOMMENDATION 5.2

***In consultation with its State and Territory Government counterparts, the Department of Agriculture, Fisheries and Forestry should establish a process for assembling and maintaining robust data on:***

- ***total funding for rural R&D in Australia — including from R&D programs not specific to the rural sector, and indirectly through the charging practices of government research suppliers***
- ***the respective shares of that funding provided by governments and private parties***

- 
- *the programs and other channels through which this funding is spent, and the way in which spending is delineated across the main rural R&D provider groups.*

### **Improved policy and program coordination**

Beyond providing a more robust conceptual foundation for government investment in rural R&D and addressing the current data deficiencies, a third aspect of the broad framework which requires policy attention is coordination across the various government policy makers and funding providers.

As discussed in the Commission's report on Public Support for Science and Innovation (PC 2007, pp. 362–63), special care is required to ensure that a concern to coordinate R&D programs and associated institutional structures does not unduly diminish diversity, flexibility and competition. Like a number of participants, the Commission sees some risks of this nature in the National Primary Industries RD&E Framework initiative (see box 5.3).

There is also a broader risk inherent in both this initiative and the National Strategic Rural R&D Investment Plan currently being prepared by the Rural R&D Council: namely, that governments will take on too great a role in directing specific research outcomes, or even attempt to 'pick winners'. As has been frequently demonstrated, overly directive approaches — even if premised on ostensibly worthy objectives such as taking a more strategic approach to decision making — can have very significant shortcomings. As well as involving decision making without information that is available to those more closely connected to the markets concerned, it can be very difficult for governments to extricate themselves from failed endeavours. In addition, when government is responsible for making most of the key decisions, the accountability of other participants in the system is commensurately reduced.

However, the Commission does see value in some sort of 'lower key' mechanism to better coordinate the Australian Government's funding contribution for rural R&D. As set out in chapter 2, this contribution — which appears to account for nearly half of total funding and more than 60 per cent of public funding — is currently channelled through a significant number of individual programs, many of which do not reside within the agriculture, fisheries and forestry portfolio.

Several participants were highly critical of the lack of program coordination to date, referring to overlap and duplication across programs, and a tendency for new programs to emerge 'out of the blue' in response to the Government-generated 'issue of the day' and without regard to opportunities to address those issues through existing programs. (See, for example, Noel Beynon, sub. 6 and South Australian Grain Industry Trust, sub. 11.)

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**Box 5.3      What might the National Primary Industries RD&E Framework deliver?**

The National Primary Industries RD&E Framework initiative — which is intended to promote more coordinated and efficient investment in, and delivery of, rural R&D and extension services in Australia — was welcomed by many participants. For example, the Winemakers Federation of Australia (sub. 15, p. 5) said that the initiative will enable research funders, providers and industry to work under a common framework to collaboratively establish a research plan that maximises the benefits from the available funding. Similarly, the CSIRO said that:

... in the past there were deficiencies in the institutional coordination across the existing RD&E framework. Therefore, we strongly support the efforts under the auspices of the Primary Industries Standing Committee. ... CSIRO believes the National RD&E framework has sufficient flexibility to enhance coordination and collaboration while retaining operational freedom for its component organisations. (sub. 123, pp. 13, 15)

In addition, in an area where state-level and regional outcomes have often loomed large in policy setting, the initiative appears to have successfully harnessed both levels of government into a policy process focused on improving outcomes for the community as a whole.

However, as several participants pointed out, the initiative is not without risks and potential costs, especially over the longer term.

- Despite the inclusion of various cross-sectoral RD&E streams, the initiative is, in many senses, predicated on preserving current levels of public funding for the existing suite of rural industries. It therefore remains to be seen how readily funding could be redistributed in the event of changing industry circumstances, the emergence of new rural industries with significant R&D needs, or the emergence of new cross-sectoral issues. As CSIRO (p. 24) observed:

... the process could lock in certain institutional structures and arrangements and lead to less flexibility over time. As agricultural industries are always responding to market signals and stochastic events such as disease and drought, industry responsiveness, flexibility and resilience are the key attributes that must be maintained for the future.

- Though consolidating funding and delivery structures would be likely to lead to some immediate cost savings and less wasteful duplication of research effort, the associated reduction in the degree of contestability within the framework may have some offsetting cost and research quality implications. Hence, the NFF raised:

... concerns about the capacity of the new model to generate competition to deliver new ideas and innovations, as well as the capacity to deliver value from the Government and industry investment made in research. (sub. 109. p.17)

Likewise, the University of Sydney (sub. 53, p. 8) said that, by placing more emphasis on non-competitive funding, the RD&E strategy potentially risks compromising excellence in research and over time reducing national capacity and outcomes.

As discussed in the text, the Commission also has some concerns about the potential for such 'directive' consolidation to go too far in the central planning direction. Thus, it will be important to closely monitor the outcomes of this initiative with a view to modification, or even termination, if there is evidence of the problems outlined above.

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It is of course easy for those on the outside to misdiagnose the causes of outcomes of this nature. Even the most effective coordination mechanisms will not preclude programs or policy decisions driven by the need to respond to short term public or political pressures. Also, as noted above, some program overlap need not be undesirable.

Nonetheless, the Commission is in little doubt that there is considerable room for improvement. Indeed, it is telling that there has not been sufficient coordination even to generate basic national-level data on funding and spending flows (see previous section). Moreover, the Commission's impression is that decisions to introduce new programs or adjust funding for particular programs, are often made without sufficient regard to the alternative funding vehicles that are available, or to what the policy framework as a whole is intended to achieve. Yet the concept of additionality, and hence the need for government involvement to add value, is just as relevant in these contexts as it is in assessing the intrinsic merits of a particular program.

In looking at what sort of mechanism might be appropriate to improve coordination at the Australian Government level, the Commission does *not* envisage adding another layer to the existing arrangements for providing high level oversight of the rural R&D framework. As well as the Rural R&D Council, entities currently tasked with an overseeing function include PIMC, the supporting Primary Industries Standing Committee (PISC) and its R&D subcommittee, and the CRRDC.

Rather, the Commission envisages the mechanism as:

- providing a coordinating function and related high-level policy advice solely in relation to Australian Government funding for rural R&D
- but also involving liaison with other relevant entities on the implications of changes in Australian Government funding programs for the totality of the rural R&D framework
- preferably drawing on existing administrative structures within the Australian Government, rather than requiring the creation of a new body.

It may well be that a standing interdepartmental committee arrangement, coordinated by DAFF, would be sufficient for this purpose. Were this approach to be adopted, then the proposed data collection exercise (see draft recommendation 5.2) could be incorporated within it.

However, there are clearly other alternatives — including the involvement of a broadly-based RDC (see chapter 6). Similarly, the functional responsibilities attaching to the new mechanism could be broader than indicated above; extending,



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for example, to explicit evaluation and reporting on the effectiveness of the totality of Australian Government funding support for rural R&D. Moreover, the most appropriate approach could depend on any coordination proposals emerging from the National Strategic Rural R&D Investment Plan. Accordingly, the Commission is not at this stage specifying precisely what form the new mechanism should take and what the exact scope of its functional responsibilities should be, but rather is seeking further input from participants on these matters.

DRAFT RECOMMENDATION 5.3

*The Australian Government should establish a mechanism to better inform and coordinate the totality of its funding for rural R&D with a view to:*

- *promoting consistency in approaches across specific and more general Australian Government programs that provide funding for rural R&D*
- *assisting in the identification of gaps or unnecessary overlaps in program coverage and means to address them*
- *informing considerations of the effectiveness of overall Australian Government funding support for rural R&D*
- *ensuring that the States and Territories and other relevant entities are fully aware of changes in Australian Government funding programs and the likely implications for other rural R&D funding arrangements.*

INFORMATION REQUEST

*The Commission seeks further input from participants on what precise form this new mechanism should take and what particular functional responsibilities should be encompassed within it.*

## **5.4 Other significant framework issues**

### **Devolution of program delivery**

For many years, a significant component of public funding for rural R&D has been channelled through entities such as the RDCs and CRCs. However, important research funding programs are also managed by government departments. At the Australian Government level, for instance, these include programs such as Australia's Farming Future, Caring for our Country and the Australian Climate Change Science Program (see chapter 2).

A number of participants were critical of the research management capacities of some government departments — citing concerns about the impact of frequent staff

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movements on the capacity to build and retain appropriate skills, and the influence of ‘issues of the day’ on the distribution of funding. For example:

- In regard to the former, the National Farmers’ Federation (sub. 109, p. 12) contended that ‘anecdotal evidence suggests that the reward structures with Government Departments do not tend to encourage or reward the development of [necessary] skills and experience’.
- In regard to the latter, the Commission was told that proposals for research funding were sometimes framed to appear to conform with climate change objectives even when the funding programs concerned did not have a specific climate change focus. More generally, the Grain Industry Association of Western Australian contended that:

Government (via government departments) has an understandable bias to direct funds to politically sensitive objectives. This does not always lead to the greatest gains for the nation as a whole. (sub. 143, p. 6)

The Commission was also told that many research providers can ‘run rings around’ some departmental managers, thereby reducing the value for money achieved from the funding concerned.

However, even assuming that such claims are soundly based, care is required in drawing strong policy conclusions from them.

- Perceived deficiencies in research management skills are not limited to government departments. For example, while the commentary on the management skills of the RDCs was generally very favourable, most participants nonetheless saw room for improvement.
- During discussions, the Commission also received very favourable input on the skills available in parts of government, and especially within some State Government departments responsible for rural R&D matters.
- The focus of some programs on broad research themes (for example, climate change), rather than on rural research per se, would militate against complete devolution of program management to entities such as the RDCs.
- Relative to a devolved approach, higher-level program management can have benefits — for instance, the capacity to introduce competition to the management of specific projects as well as to their delivery.

Hence, a broad brush presumption in favour of devolved research management would not be appropriate.

Even so, the Commission’s impression is that, at both the national and State and Territory level, there is considerable variability in the effectiveness of departmental

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program management and follow-up evaluation. It further notes that it can be difficult for departments to address factors such as high staff turnover, notwithstanding the adverse impacts that this can have on program outcomes.

Also, while State and Territory Government funding programs are often delivered ‘in-house’ through their networks of research stations, funding for programs managed by Australian Government departments is typically provided to external contractors, who are often selected through a competitive tender process. As noted in chapter 4 and discussed further in chapter 6, such competitive tendering regimes have costs as well as benefits — especially where departments do not have access to a ready bank of relevant expertise.

Accordingly, while the Commission is not proposing to make a specific recommendation on devolution matters, it considers that somewhat greater devolution of program management tasks could be beneficial. It is therefore important that, whenever new departmental programs are proposed — or existing programs are reviewed — the merits of instead devolving all of the managerial function to experienced research managers (such as the RDCs) is explicitly examined. At the Australian Government level, the proposed new program coordination mechanism (see draft recommendation 5.3) could be employed to ensure that this occurs.

### **Reducing incentives for cost shifting**

As noted earlier, leveraging — that is, tapping into more than one funding pool to augment the money available for a project — can have important benefits. Indeed, it is a normal commercial practice.

However, where the goal of leveraging is solely to shift the funding burden onto other parties, there will be no benefit for the community to offset the variety of costs outlined above.

To a large extent, the scope for unproductive cost shifting arises from the fact that funding regimes for government research suppliers are designed to encourage those suppliers to augment core funding appropriations with income from commercially focused contract and collaborative research work for and with third parties. As the Commission argued in its 2007 report on Public Support for Science and Innovation, funding regimes of this nature can have important benefits.

- An ‘at risk’ funding component can increase the incentives for good performance — a government research supplier that does not offer value for money is unlikely to be successful in securing contract work.

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- The act of partnering on a commercial basis is likely to provide the supplier with information on the sorts of R&D that are most useful to users, and on ways to facilitate adoption, with benefits for the rest of its research program.

In fact, for these sorts of reasons, the efficacy of ‘dual’ funding has been widely endorsed both in Australia and internationally, with the Commission (p. 515) also concluding that the rationales for it are sound.

Accordingly, any initiatives to address the sort of unproductive cost shifting that has been evident in the rural R&D area would need to preserve the broader benefits of the current funding approach. Moreover, such initiatives would most likely have implications beyond the rural arena, and are therefore beyond the reasonable remit of this particular inquiry.

Nonetheless, the Commission considers that further exploration of these matters is warranted, having regard to:

- the suggestion from CSIRO (sub. 123) for a set of general guidelines and principles covering collaborative research performed by government research suppliers
- the endorsement of ‘full cost’ pricing for contract research services in the recent task force report on New Zealand’s Crown Research Institutes (CRIT 2010).

A working group made up of representatives from the relevant areas of the Australian and State and Territory Governments and from government research suppliers would be one vehicle for taking these matters forward.

### **What is the role of government in regard to extension?**

As discussed earlier, provision for adoption of research outcomes does not always appear to have been given sufficient attention in the past. The specific reference to the importance of adoption in the Commission’s proposed overarching public funding principles for the rural R&D framework is intended to help ensure that adoption issues are more to the fore in the future.

However, as alluded to in section 5.1, the question which then follows is how responsibility for funding extension services should be shared between governments and primary producers. In this regard, many participants expressed concern about reductions in State and Territory Government funding for extension services and the consequent need for the RDCs and other parties to fill the funding gap. (See for example, Across Agriculture, sub. 116; Apple and Pear Australia Limited, sub. 60; and CSIRO, sub. 123 — and, for a contrary view, Evergreen Farming, sub. 152.)

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Such concerns are understandable within the context of a framework where funding support from government has often been seen as an entitlement with few specific strings attached. But if public funding is instead viewed as a complement to private funding in circumstances where the latter would not alone be sufficient to generate efficient outcomes, reductions in State and Territory Government funding for extension need not be unreasonable. That is, in considering the appropriate role for government in the area of extension, exactly the same market failure and additionality considerations arise as for the research work itself.

Like the research work component, applying the additionality principle to the extension component will involve considerable judgement, having regard to the particular circumstances involved. For example:

- While the case for a government contribution will generally be greater for information dissemination and group extension activity than for one-on-one services to producers, there may be situations where support for the latter will be warranted. A case in point is for adoption of research aimed at addressing the adverse environmental impacts of rural activities. As noted in chapter 3, where such adverse impacts cannot be readily attributed to individual producers, and in the absence of regulation, there may be little financial incentive for those producers to investigate different practices even if these would deliver significant benefits for the community.
- Even for research designed to enhance on-farm productivity, free-rider concerns may inhibit private investment in extension activity.

What this highlights is that the potential for spillover-related market failures to influence producers' behaviour does not disappear as soon as the extension phase is reached. Thus, if there is insufficient public funding support for extension, worthwhile research outcomes are likely to be adopted more slowly, in turn diminishing the benefits from taxpayer funding for the research component.

However, the Commission does not see any value in specific principles to guide government funding for extension services. At a broad level, they would be no different from those enunciated in draft recommendation 5.1. That said, the Commission considers that application of these principles would, over time, most likely require private parties to assume a greater share of the funding load — and thereby reinforce other means to increase the private sector's role within the rural R&D framework (see below).

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## Monitoring R&D capacity

The capacity to meet future rural R&D needs will depend on the availability of appropriate scientific expertise and research skills, and access to quality research infrastructure. As emphasised earlier, even as primarily an adaptor of technologies developed elsewhere, Australia must maintain sufficient capacities to sustain this adaptive function and the relevant links to overseas research networks.

Many participants expressed concerns about existing or looming skill shortages and also about the perceived run down of State and Territory Government infrastructure — a key part of Australia's overall rural R&D infrastructure network. Some went on to suggest that critical research mass is now under threat (see box 5.4).

Given the focus of this inquiry, and the concurrent stocktake of infrastructure that is occurring as part of the National Primary Industries RD&E Framework and National Strategic Rural R&D Investment Plan initiatives, the Commission has not examined broad skilling and infrastructure adequacy issues in any detail. However, it notes that:

- The continued ageing of Australia's population will tighten conditions in many sectoral labour markets. This will focus more attention on how to get better value from the available workforce and how to boost labour market participation, as distinct from sector-specific initiatives designed to increase workforce numbers in particular parts of the economy.
- Even so, over time, severe skill shortages in particular areas are typically ameliorated through market forces. That is, upward pressure on wages and salaries will usually translate to increased demand for training in the profession concerned.
- Specific skill shortages can also be eased through the employment of overseas trained workers or, in this case, by scientists trained in related disciplines.
- State and Territory Governments are not the only sources of funding for rural research infrastructure. Through funding for CSIRO and the universities, the Australian Government maintains a major commitment in this area. Indeed, via the National Collaborative Research Infrastructure Strategy, it has provided funding to refurbish or upgrade some State and Territory Government infrastructure. In addition, some of the RDCs and CRCs provide funding for educational activities (see chapter 4).
- The provision of rural research infrastructure is not the sole province of government. Private firms, such as chemical companies and plant breeders, provide some facilities as well — and more could be motivated to do so were an unmet demand and therefore an investment opportunity to be there.

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#### **Box 5.4      Concerns about future rural R&D research capacity**

To ensure that Australia has the capacity and capabilities needed for agricultural R&D, our universities and research organisations need to have access to adequate funds. The researcher population is ageing. We need to be sure that vibrant research attracts students and provides quality research training. Continuity of funding is necessary to ensure that skilled research resources are available when they are needed. (Australian Academy of Technological Sciences and Engineering, sub. 37, p. 6)

There is a need for government and industry to contribute to core rural research skills and infrastructure. The systems whereby government departments and agencies employed graduates through specific programs, cadetships etc were very important ... The loss of these programs has resulted in a decrease in the research and extension capacity within Australia. (Cherry Growers of Australia, sub. 96, p. 8)

To maintain an effective rural RD&E effort, the Government's policy must have a clear long term commitment to sustaining the human and physical resources required for this task. There are concerns that some scientific fields are reaching critically low numbers and facing significant difficulties in recruiting new entrants to the discipline, to extents that will affect capability in the medium term. (CRRDC, sub. 128, p. 34)

There has been a contraction in the 'pool' of research talent in key science disciplines required by the egg industry ... and this has resulted in AECL becoming a 'price taker' for the scarce research resources that remain. That is, AECL has less ability to seek competitive tenders when employing specialist research or science skills. (AECL, sub. 119, p. 25)

There are long lead times with RD&E — we have run down our capacity possibly below critical mass and will be dependant on overseas expertise — except they have also done the same ... The universities have falling student numbers — this needs to be reversed. (Charles Nason, sub. 2, p. 1)

The decline in the capacity of research capability in the country over the last ten years or so has been nothing short of criminal in the minds of most rural inhabitants. The closure of at least two research stations by CSIRO and others by both the Victorian and NSW Governments and probably by other states as well .... has lead to the overall reduction in capacity and has contributed to the general feeling of being devalued by rural communities. (High Security Irrigators Murrumbidgee, sub. 16, p. 2)

There is an increasing shortage of researchers in the wool industry and in many sectors of Rural Industry with more students and researchers moving to the environment, natural resource management and climate change areas rather than in traditional production based areas. ... With declining ability to resource adequately good research projects it is inevitable that improvements in productivity that are essential to maintain the global competitive position required by Australia if its rural industries are to remain competitive and sustainable will not be achieved. (Australian Superfine Wool Growers Association, sub. 9, p. 22)

IAIST regards the reduction in core State (and Commonwealth) funded capacity as a major issue facing the effectiveness of its operations and the impact of the RD&E effort overall, with major long term consequences in Australia. (Australian Institute of Agricultural Science and Technology, sub. 12, p. 8)

It is essential that core research skills in the honey bee industry be maintained. One reason ... is the increasing number of biological problems arising from a globalising world economy. ... Without the necessary research skills and infrastructure in place, there can be delays or failures in dealing with these responses with major consequences not just for industry, both beekeepers and pollination dependent industries, but also for public health and the environment. ... (Australian Honey Bee Industry Council, sub 7, p. 13).

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That said, in overlooking the policy framework, governments should be monitoring what is happening to research capacities and whether there are any particular impediments to prevent emerging needs being met within a reasonable timeframe.

Also, there are some more specific ‘system capacity’ issues which seemingly warrant further exploration.

- Some participants (for example, Evergreen Farming, sub. 152; the National Farmers’ Federation, sub. 109; and Noel Beynon, sub. 6) argued that not enough is being done to maintain and disseminate the legacy of past research efforts. More specifically, several participants were critical of the amount of information on research outcomes made available by certain RDCs and their perceived tendency to shield results under confidentiality clauses. (See for example, the Australian Beef Association, subs. 154 and 162; and the Department of Agriculture and Food Western Australia, sub. 137.)
- Other participants (for example, the Victorian Department of Primary Industries, sub. 161) said that insufficient policy attention and resourcing has been provided for gene banks and reference collections of insects and plant and animal diseases and pathogens.

Through initiatives such as Australian Agricultural and Natural Resources Online, and the commercial information repository, FarmPlus (see sub. 151), efforts have been made to provide better access to past research work. As a result of the activities of some of the RDCs and private plant breeders, there is also a considerable store of genetic knowledge within the current system.

The Commission further notes that concerns about the dissemination of research results by the RDCs were very much in the minority, with DAFF (sub. 156, p. 34) contending that ‘the majority of R&D findings funded through industry levies and public investment are freely available in the public domain, rather than commercially through proprietary rights.’ (Meat and Livestock Australia (sub. 158) also vigorously defended its research dissemination record.) More generally, where intellectual property is involved, getting the balance right between dissemination and protection for a valuable asset can be tricky. In this context, the Australian Academy of Technological Sciences and Engineering (sub. 37, pp. 5–6) suggested that, to prevent free riding by overseas competitors, detailed results of RDC research should not be freely available for at least three years.

Nonetheless, there may well be more that could be done to facilitate access to the information and other building blocks for future rural research. Though, again, the Commission is not putting forward any specific proposals, it is seeking further input on whether the remit of its proposed new non-industry RDC (see draft



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recommendation 6.1) might reasonably extend into the information repository area. As well, there would most likely be linkages between any initiatives in this area and the collection of better data on funding and spending flows within the rural R&D framework (see draft recommendation 5.2). Thus, as the Tasmanian Department of Primary Industries, Parks and the Environment (sub. 148, p. 17) observed, a national data base for rural R&D could potentially extend to reports on past and current projects — as is the case for the previously mentioned data base maintained by the US Department of Agriculture. As such, there might be scope to bring Australian Agricultural and Natural Resources Online within the proposed new data collection mechanism.

Finally, the Commission's proposed new principles to guide the future operation of the RDC program (see draft recommendation 8.1) would require RDCs, as a condition for receiving public funding, to promote effective dialogue with stakeholders, including through the publication of information on the outcomes of all completed research projects. This requirement, and monitoring of compliance with it, should help to address the concerns referred to above.

### **Facilitating greater private sector investment in rural R&D**

As discussed earlier, the Commission considers that there is a strong case for private parties to shoulder more of the overall funding load for rural R&D, although that transition should occur over time, as reflected in the Commission's proposals for the future funding of industry-specific RDCs (see draft recommendation 7.1).

If the private sector is to take on a greater funding role in the future, it is obviously important that there are no unnecessary regulatory or other impediments to it doing so. This is why the Commission has proposed changes to make it easier for levy paying industries to change the rate of their levies (see draft recommendations 9.1 to 9.3).

In discussing private investment issues, several participants also raised concerns about time consuming and costly requirements for testing and registering new agricultural and veterinary chemicals (for example, the National Farmers' Federation, sub. 109; and SAGIT, sub. 11); and restrictions on the use of genetically modified crops (for example, the CRRDC, sub. 128; and Across Agriculture, sub. 116).

Because such regulations are ostensibly in place to promote health and safety objectives, reducing their restrictiveness will not necessarily be appropriate. But inconsistent approaches by different regulators across Australia will generally be

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difficult to justify unless specific regional considerations are involved. Moreover, whatever regulatory standards are ultimately judged to be appropriate, it is important that the rural R&D perspective is factored into the decision making process. Both the entities responsible for overseeing the rural R&D framework and industry representative bodies have a role to play here.

Concerns were also raised about the disincentives for private parties to engage in collaborative research with RDCs and government research suppliers because of the difficulties and costs of coming to agreement on intellectual property rights. These concerns and some possible general responses to them were discussed extensively in the Commission's 2007 report on Public Support for Science and Innovation. Accordingly, the Commission is not intending to go over this ground again. However, as the discussion on possible changes to royalty arrangements for plant breeding rights in the Commission's draft report on Wheat Export Marketing Arrangements (PC 2010, pp. 269–270) illustrates, there may be intellectual property reforms specific to the rural sector that could help to promote private sector investment in rural R&D.

Finally, and perhaps most importantly, if the private sector is to shoulder more of the overall funding load for rural R&D in the future, it must be treated as an integral part of the overall framework. With government having been the dominant funding and provider entity, this has not been the case in the past. While viewed as an important player in particular areas or industry sectors — for example, in plant breeding, agricultural and veterinary chemicals and in the sugar sector — for the most part, the potential contribution of the private sector has been given only limited consideration. Notably, *Across Agriculture* (sub. 116, p. 47) claimed that there has been little consultation with private companies as part of the development of the National Primary Industries RD&E Framework.

There is evidence that the current mindset at the policy making level is beginning to change. For example, in its submission, the Victorian Department of Primary Industries (sub. 161, pp. 13–14) provided several case studies of funding initiatives where there has been a pre-determined strategy for progressively increasing the leadership and funding role of private parties. However, further attitudinal change is required. Without it, affecting a similar shift in mindset within the rural community will be that much more difficult.

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## 6 Should the RDC model be retained?

### Key points

- Though there are some shortcomings in the RDC model as it is currently configured, it is highly unlikely that a completely different approach would deliver as good an outcome for the community.
  - Reallocating the Australian Government's current funding contribution to the RDCs to either CSIRO or the universities would lessen interaction with primary producers, leading to fewer reality checks on the worth of R&D and slower uptake of research outputs. There would also be less competition in the supply of the research concerned.
  - Reallocating the Government's contribution to departmental programs would similarly lessen interaction with primary producers and would also require new and potentially costly mechanisms to channel funds to research suppliers. Deficiencies in program management skills within some government departments could further detract from the outcomes delivered by this approach.
  - Relying solely on the generally available R&D tax concession would be problematic on practical grounds, as well as giving rise to some more fundamental efficiency and transitional concerns.
- But while the case for retaining core elements of the RDC model is very strong, changes to the way in which the Government's contribution is provided could significantly increase the value derived by the community from that contribution.
- Specifically, the Government should create and fund a new non-industry RDC — Rural Research Australia (RRA) — to invest in the sort of broader rural research that is likely to be under-provided by the industry-specific RDCs.
  - The RRA's remit should encompass land, water and energy use, with consideration given to consolidating relevant R&D currently funded and managed through other programs within the new entity.
  - It should be created as a statutory corporation under the PIERD Act, with the appropriation from the Government provided under a quadrennial funding agreement.
  - It should be able to supplement that appropriation with funding from other sources.
- At the same time, Australian Government funding for the industry-specific RDCs should be gradually reduced, with those RDCs left to focus predominantly on R&D of more direct benefit to their levy payers.

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As discussed in chapter 4, the RDC co-investment model has some important strengths and appears to have delivered significant benefits, especially through improving the productivity of Australia's rural sector. Indeed, a very large majority of participants supported retention of the model, arguing that it has served the rural sector and Australia well and is highly regarded internationally. A sample of participants' comments is reported in box 6.1.

Equally, there was widespread recognition that the model, both generically and in its various specific applications, is not problem free. There was also recognition that the research needs of the rural sector and the requirements of the Government as a major investor in rural R&D are changing, meaning that approaches which have been successful in the past will not automatically be so in the future.

In broad terms, the Commission agrees with all of these sentiments. There is much to like about the RDC model and, notwithstanding its shortcomings, it would be easy to make things worse. However, given those shortcomings and also changing research and policy imperatives, the strengths and past successes of the model are not a sufficient reason to roll it over and focus simply on fine tuning initiatives. Rather, the model and possible alternatives to it must be assessed against the sort of public funding principles enunciated in the previous chapter. To this end, section 6.1 discusses whether there is anything to suggest that the model is 'obsolete' or otherwise fundamentally flawed. Section 6.2 looks at the strengths and weaknesses of alternative approaches, with section 6.3 presenting the Commission's assessment of how the current broad approach should be modified to deliver better outcomes for the community as a whole.

## **6.1 Is the RDC model still fundamentally sound?**

Many of the relatively small number of more specific shortcomings in the RDC model could be addressed without significantly changing its nature (see chapter 8).

In addition, some of the broader criticisms of the model seem overstated. For example:

- As the discussion in chapter 4 indicates, the RDCs collaborate extensively amongst themselves and with other research funders and providers, both domestically and internationally. Indeed, the positioning of the RDCs within the broader rural R&D framework, and the nature of the model itself, necessarily involves a high degree of collaborative effort.

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### Box 6.1 Participants' views on the future of the RDC model

A few participants contended that the RDC model should be discontinued, or at least very significantly modified.

The current RDC model is not effective on a range of levels and should be replaced by a new delivery structure. (Queensland Murray Darling Basin Committee, sub. 52, p. 1)

... the [RDCs] indulge in a lot of 'development' ... and marketing which is not their primary role ... And large sums that were once dedicated to research are now absorbed in administration. (David Lindsay, sub. 76, p. 1)

Ultimately without significant change within the GRDC, the WAGG recommends [its] termination in favour of a Western Australian state model ... directly linking grower levies to on ground research at local and regional levels. (WA Grains Group, sub. 61, p. 3)

However, the very large majority supported continuation of the model, typically with no or only relatively minor modifications.

The Australian RDC model is unique. No other nation has a model that combines such strong linkages — between science, producers in the supply chain, and government. Its synergies have made the model very highly regarded throughout the world. (Council of Rural Research and Development Corporations, sub. 128, p. 4)

Since its inception the RDC model has proven to be an effective research funding vehicle and has supported key research that has delivered productivity gains to the rural sector, and the nation more broadly. The model is the envy of research providers in other nations. (CSIRO, sub. 123, p. 6)

DAFF holds the view that broadly speaking the RDC model is still the most appropriate mechanism to increase investment in R&D to help Australian rural industries remain internationally competitive and sustainable. (Department of Agriculture, Fisheries and Forestry, sub. 156, p. ii)

[The department believes] that the current RDC model is fundamentally sound and has served primary industries and the community of both NSW and Australia well. ... The modest investment by Government ... is complimentary to more traditional government policy 'levers' and in many instances provides an effective alternative to these ... (Industry and Investment NSW, sub. 69, p. 3)

The Queensland Government supports the current RDC model with its industry contribution and input into strategic priorities. In general, this partnership approach has worked well. (Queensland Government, sub. 153, p. 9)

The policy model has proved to be a robust one that meets both industry and government needs, and has been flexibly adapted to the specific requirements of different rural industry sub-sectors. This is important, particularly as rural industries in Australia are quite diverse in structure, geography and in the markets they service. (Across Agriculture, sub. 116, p. viii)

The ... model has brought great value to many of our rural industries, regional areas and our country. [Though there are significant areas for possible improvement] the model is not busted, so I urge the federal government not to throw it out. (Ian Rogan, sub. 1, p. 1)

While acknowledging there is always room for improvement the [RDC] model has generally worked well ... We would trust that problems perceived or real in some specific industries are addressed in other ways rather than dismantling what has been and is a very valuable and efficient instrument for improving the productivity and sustainability of agriculture and rural communities in Australia. (Corporate Agriculture Group, sub. 134, p. 3)

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- Similarly, even a cursory examination of the RDC research portfolio reveals that broader cross-sectoral research issues have not been totally ignored. Moreover, pressure from the Government for the RDCs to fund more cross-sectoral and other broadly-based research as a quid pro quo for public funding, is a relatively recent development. As noted in chapter 4, for a variety of reasons, project portfolios cannot be realigned overnight. Also, the Government has provided only very broad indications of what it perceives to be the unmet research needs and even less guidance on how the activities of the RDCs should mesh with dedicated R&D funding programs in areas such as climate change and land management. It is precisely for these sorts of reasons that the Commission has proposed that a mechanism be established to better coordinate Australian Government funding for rural R&D (see draft recommendation 5.3).
  - Reforms to aspects of the broader rural R&D framework would help to address concerns about the potential for the activities of the RDCs to have negative as well as positive impacts on the outcomes delivered by the framework. Reducing the opportunities for RDCs and other entities procuring research from government suppliers to effectively shift costs back onto government — or to ‘skew’ those suppliers’ core research programs towards applied work (see chapter 5) — is one such example.
  - Concerns about inefficiencies and inequities in the industry funding component of the model are, to the extent that they are valid, more a reflection of the particulars of the levy system and the specific ways in which levy funds have been spent. Thus, as discussed in chapter 9, there are several means by which the levy system could be streamlined and made more flexible for levy payers. Also, there is no one regional distribution of research benefits that must emerge from the RDC model. Rather the regional distribution of benefits will depend on the circumstances of an industry and the research opportunities that are available, and can be adjusted over time if there are good reasons to do so.

Even so, looking to the future, there is a significant question mark over the suitability of the *current* RDC model to cater for the increasingly divergent R&D needs of the model’s two principal stakeholders.

In the first instance, the model seeks to address the research needs of individual rural industries with a particular emphasis on improving productivity and/or reducing costs. This may well involve collaborative research effort, research with an environmental focus, or research which has significant ‘incidental’ environmental or social benefits. But to the extent that the research agenda is driven by the industry constituency, the focus will still understandably be on delivering a ‘bankable’ benefit for that constituency. For example, in commenting on that portion of its portfolio covering established industries, the Rural Industries RDC

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(RIRDC) said that while there are some clear public benefits that emerge from this research:

Unlike RIRDC's other portfolios, research in these areas does not necessarily have an explicit public policy focus, so the return to government funding contributions is more difficult to define (*as is the case for most activities supported by rural R&D corporations*). (sub. 92, p. 47, emphasis added)

Similarly, Australian Pork Limited (sub. 117, p. 26) said that industry levies should be used to fund applied R&D rather than higher risk more basic research 'not aligned to industry need', and that this 'is consistent with the investment guidelines put in place by APL'.

As emphasised in chapter 4, such R&D may well be very valuable. Indeed, the direct financial stake that the industry constituency has in the RDC model, and the reality check that this provides on the worth of proposed research, is one of the strengths of the model.

However, with levies in place to help to address free-rider problems, the inherent financial incentives for primary producers to collectively invest in productivity enhancing R&D would seem to be generally strong. The implication is that the impact of a government contribution in inducing additional research of this nature is likely to be relatively modest, with its primary effect being to shift part of the payment for that research from producers to the wider community.

At the same time, in return for the government contribution, the model also seeks to facilitate non-industry specific rural R&D where a greater proportion of the benefit stream flows to the wider community. In this case, the research supported by public funding is more likely to be additional. But the diversion of RDC funds, including a component of levy payments, into more broadly-based research will create a potentially significant tension with industry stakeholders — a tension that has been clearly evident in industry input to this inquiry.

Until recently, this tension was submerged as a result of the Government behaving as a passive stakeholder. In effect, the interests of the industry held sway, with the Government's research requirements separately addressed through the activities of Land and Water Australia (LWA), and some dedicated (non-levy related) funding for RIRDC and the Fisheries RDC (FRDC).<sup>1</sup>

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<sup>1</sup> It was in the context of industry interests predominating — and the evaluation evidence suggesting significant direct benefits for primary producers from much of the research funded by the RDCs — that the Commission concluded in chapter 4 that the overall amount of additional R&D induced by government funding for the RDCs has most probably been modest.

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However, with the abolition of LWA and reductions in the ‘public good’ appropriation to RIRDC, together with the Government’s expressed desire to see more ‘cross-cutting’ research undertaken by the other RDCs, the tensions in the co-investment model are increasingly to the fore.

Importantly, without significant changes to the model, there are likely to be several constraints on the scope to increase the amount of additional R&D induced by the Government’s funding contribution — and especially the amount of research for which much of the benefit accrues outside of the levy paying industries.

The Commission reiterates that a focus on additionality does not entail seeking to forensically eliminate public funding for *any* prospective RDC projects that could potentially be fully funded by private parties. Because of the uncertainties involved in judging precisely what would happen absent a government contribution, at some point, the likely costs of ‘overshooting’ will exceed the likely benefits from removing ‘redundant’ public funding support. Thus, as for other R&D support programs, some subsidisation of research that would have occurred anyway is both inevitable and justified. Moreover, the Commission recognises that the degree of additional research induced by matching government funding for industry contributions is likely to vary across the RDCs (see chapter 4).

Nonetheless, if the Government is to continue to make a substantial funding contribution to the RDC program, then the Commission considers that there needs to be a likelihood that this contribution will induce more additional research than currently appears to be the case.

Given the need for RDC boards to be responsive to the demands of levy payers, achieving a shift of any consequence in the current research balance would almost certainly require the Government to be more directive about the R&D that it wished to be funded in return for its matching contributions. Exhortations can only do so much, even if they mean that ‘blue sky’ and wider public benefit research are now more ‘front of mind’ than in the past. In effect, the Government would have to better specify its research priorities and, more importantly, be prepared to enforce those priorities — including through a greater willingness to reduce or withdraw funding if they were not met.

One concern with such an approach would be the potential for diversion of funding into research that was genuinely additional, but also of low social value.

For industry-focused research, the Commission does not consider this risk to be unduly high. As discussed in chapter 8, a requirement for RDCs to demonstrate that they have undertaken a reasonable amount of longer term/larger scale/higher risk



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R&D may be sufficient to achieve greater research additionality without the need for the Government to involve itself in more detailed project selection.

However, significantly increasing the amount of broader rural research conducted by the industry-specific RDCs would almost certainly require a heavier government hand. Notably, this would be in contrast to the situation that existed when LWA, with no industry constituency to answer to, was used to sponsor R&D of this broader nature. That is, when the Government was able to call on LWA, it could be much surer that its broad research requirements in areas such as climate change and water use would be met without the need to try to tightly prescribe them.

More importantly, without substantial changes to the current configuration of the model, any attempt to shift the research balance towards broader public benefit type work could threaten the stability of the entire co-investment approach. This is because with the bulk of the Government's funding contribution bundled with levy payments, any change in the way the government contribution is spent will also affect how levy funds are spent. In these circumstances, as submissions to the inquiry illustrate, there would almost certainly be very strong resistance from levy payers (and even some of the RDCs) to a significant move away from a focus on research directed at productivity improvement or delivering other direct benefits to primary producers. For example, the Australian Meat Processor Corporation (AMPC) stressed that any cross-sectoral research initiatives:

... should not erode the vital RDC focus on the national priority of lifting productivity — through R&D, innovation and capacity building, at sector and enterprise level, by harnessing entrepreneurs, cultures and ways. (sub. 111, p. 48)

Indeed, if levy payers perceived that the balance had moved, or could move, too far, they might vote to abolish or significantly reduce their levies, leading to the effective collapse of the arrangements. As the following comments from participants indicate, this is not simply a theoretical risk.

... producer support for any levy system would be severely damaged where they were not given strong input into the expenditure of funds. Government control of the levy payer funds may be characterised as a tax and face a substantial levy payer backlash. (NSW Farmers' Federation, sub. 145, p. 23)

If the government were to amend its co-contribution so that these favour activities that focus on delivering benefits outside industry this could reduce farmers perception of the potential gains from levy-funded R&D, the degree of industry control and, ultimately, the value of continued participation in an industry levy scheme. This would, in turn, put pressure on the rate of levy that farmers are willing to contribute or even whether they support a levy-based system. (Dairy Australia, sub. 130, p. 27)

Others to make similar observations included Australian Wool Innovation (AWI; sub. 110, p. 53), and Simon Price, policy director of the Victorian Farmers'

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Federation (sub. 94, p. 3), who succinctly synthesised the nub of the issue in stating that ‘efforts by governments to direct funding will be self-defeating.’

In the Commission’s view, the preceding discussion indicates that the current industry-focused RDC model is not well suited to providing a good return to the community in return for its funding contribution — especially where research needs are sector-wide, or primarily relate to the interests of those outside the rural sector. Similar observations were also made by several participants without a direct stake in the model, including Irrigation Australia (sub. 90, p. 11); the Australian Land Management Group (sub. 103, p. 4); the Queensland Government (sub. 153, p. 20); and the CSIRO (sub. 123) with the latter (p. 3) commenting that:

The RDCs operate well within their sector specific boundaries, but in our experience have been less well suited to address cross-sector issues that are emerging as national challenges (water, sustainability, climate adaptation and mitigation, healthy soils etc).

This does not necessarily mean that the entire RDC model should be abandoned. The Commission reiterates that the model has important strengths. Nonetheless, in considering the merits of persisting with a revamped version of the current model, the benefits and costs of alternative approaches need to be considered.

## **6.2 How do the alternatives measure up?**

There are several possible alternatives to the current RDC model. Some would involve the reallocation of current public funding for the RDCs to other existing programs. Others would involve the creation of new investment and delivery vehicles within the broad RDC umbrella.

Most of these alternatives are not mutually exclusive, meaning that there would be scope for some mixing and matching. However, for ease of exposition, in the discussion that follows, they are treated as stand-alone approaches.

### **Reallocating the government contribution to CSIRO or the universities**

Reallocating current public funding for the RDCs to CSIRO and/or the universities would have some in-principle attractions. In particular, the sort of core research that these entities undertake is arguably more likely to have significant spillovers for the wider community than the R&D conducted by the current group of RDCs. In turn, this suggests that the amount of additional research induced by the government funding involved would be greater than at present. Indeed, in its submission to the Commission’s recent inquiry into Public Support for Science and Innovation, CSIRO (2006, p. 63) said that its policy was not to fund research that the private

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sector is likely to support itself — and that consistent with this policy it had been moving to reallocate appropriation revenue from research areas with the greatest potential to encroach on private research efforts.

However, the R&D sponsored by the RDCs is generally of a more adaptive and problem-specific nature than much of the core research performed by CSIRO and some of the universities. As such, it is largely a complement to, rather than a substitute for, that core research. Thus, any transfer of public funding from the RDC program to CSIRO or the universities would inevitably, and sensibly, have to be accompanied by some directive on how the money should be spent.

While the removal of the RDC ‘middle man’ from the contracting chain would still offer the prospect of some administrative cost savings, there would also be potentially significant deleterious impacts.

- Without the involvement of the RDCs, there would most likely be less interaction with primary producers and thereby fewer reality checks on the worth of proposed research, or the way in which it was conducted. In this regard, the Ricegrowers Association of Australia (sub. 24, p. 15) argued that links with agricultural producers would be greatly diminished, especially as CSIRO and the universities fall within different ministerial portfolios. And the Australian Lot Feeders’ Association (sub. 19, p. 9) doubted that, under this funding approach, innovative breakthroughs such as the development of Rhinoguard vaccine to address respiratory disease would have occurred.
- Less direct producer input, and reduced connectivity with extension services, would most probably also result in lesser or slower uptake of research outputs. This would further diminish the worth of those outputs for the community.
- There would be a substantial reduction in competition in the delivery of the R&D concerned. That is, CSIRO and/or the universities would no longer have to compete with each other and with State Government and private providers to supply research to the RDCs. (In effect, ‘competition’ would be limited to any competing claims by CSIRO/the universities for access to core funding based on their particular capacities in the rural R&D area.) As discussed in the next section, the benefits of contestable research delivery processes will depend on the particular circumstances and how those processes are configured. However, in the Commission’s view, the reduction in competition that would result from the removal of the RDC middle man would most likely lessen research ‘efficiency’. It could also directly put upward pressure on project costs, thereby offsetting any administrative savings from a shorter contracting chain.

Synthesising the concerns of participants about this funding alternative, the Cotton RDC (sub. 68, p. 15) referred to an inevitable loss of industry focus in the research

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work, claiming that this would lead to a ‘dramatic’ drop in research efficiency and diversity. In fact, virtually the only support for such a redirection of public funding came from a wool industry participant (sub. 17) — and even here, that support was seemingly premised as much on concerns about the performance of AWI as on the intrinsic merits of the approach.

## **Reallocating the government contribution to departmental programs**

The Commission has strong reservations about reallocating current government funding for the RDCs to Australian Government departmental programs sponsoring research into climate change, landcare management, water conservation and the like.

In some circumstances, departmentally managed programs may have advantages — particularly if a tender or similar competitive process is used to allocate those funds. As well as helping to ensure that research is undertaken by those providers that offer the best value for money, such contestable allocation processes require governments to specify the basis on which funds will be awarded and can thereby help to clarify precisely what that funding is intended to deliver. It is therefore theoretically possible that allocating the public funding currently provided to the RDCs through contestable departmental funding programs might be a means to increase the amount of genuinely additional, socially valuable, rural R&D induced by that funding.

On this basis, Dairy Australia (sub. 130, p. 34) countenanced the possibility of using the approach to cater for designated national interest rural issues — though as an addition to, not a replacement for, current RDC funding. A similar suggestion was made by the Queensland Government (sub. 153, p. 12) which referred to the possibility of special purpose funding rounds for cross-sectoral research work, along the lines of the arrangements for funding climate change research. Indeed, under such a regime, RDC-like entities that accessed funding from levies and contestable departmental programs could presumably still exist.

However, the approach would also have some potentially very significant drawbacks.

As for the CSIRO/university option, with departmentally managed funding, many of the current reality checks on the worth of particular projects, and the industry linkages that aid the uptake of research outputs, could be considerably weakened. In this environment, the Commission is concerned about the potential for departmental programs to finish up supporting research that is additional, but also of limited overall value to the community. This could well be an inferior outcome to providing

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public funding to the RDCs for worthwhile research that primary producers would have had strong incentives to fully fund themselves.

Moreover, as participants such as the Australian Land Management Group (sub. 103) observed, the accompanying tender (or similar) processes for allocating funding would bring with them some well documented problems. For example, such processes can:

- be administratively expensive and involve significant compliance costs for those seeking to secure funding
- reduce the certainty of funding for research suppliers in a way that undermines longer term research capabilities
- be vulnerable to political interference or lobbying behaviour.

More specifically, the Commission was frequently told that, as continuity in funding is critical for the viability of research suppliers, where contestable funding allocation mechanisms are employed, the best scientists are typically given responsibility for preparing bids — thereby reducing the time they have for actual research activity. On occasion, the RDCs also employ tender processes to allocate funds. However, as discussed in chapter 4, the flexibility in the model only requires them to do so where a tender process would add genuine value. Particularly for reputable research suppliers that have built up linkages with RDCs, allocating all of the funding currently provided to those RDCs through contestable, departmentally managed, programs could therefore be costly.

Notably, in light of the problems that can arise from over-reliance on contestable funding approaches, in its report on Public Support for Science and Innovation, the Commission (PC 2007) found that making CSIRO and the universities more dependent on such funding streams would not be appropriate. Similarly, in line with recommendations in a recent task force report (CRIT 2010), the New Zealand Government is intending to make its Crown Research Institutes less dependent on ‘at risk’ funding.

A further very important consideration in the particular context of this inquiry is that effective contestable allocation mechanisms require that those responsible for their management have the expertise to specify research requirements appropriately and to make wise judgements about the relative merits of competing bids. As discussed in section 5.4, the rural R&D management and evaluation expertise available to government departments is seemingly variable. Indeed, even with ready access to relevant expertise, configuring contestable allocation mechanisms to induce significant additional R&D can be challenging (see PC 2007, pp. 414-421).

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Collectively, the preceding discussion suggests that redirecting the public funding currently provided to the RDCs to departmentally managed rural R&D programs would be most unlikely to benefit the rural sector or the community. As well as the specific costs attaching to the accompanying funding allocation processes, the increased potential for investment in research that is additional, but also of limited social value, militates strongly against the approach.

## **Reconfiguring the RDC model**

Within the RDC framework, there have always been arrangements to address some broader research needs, funded by an appropriation from the Government that is not linked to levy payments by particular industries. In some cases — RIRDC and the FRDC — these arrangements have been a separable component of an otherwise industry-based RDC. However, the recently abolished LWA and the former Energy Research and Development Corporation (ERDC), which operated between 1990 and 1999, were tasked solely with undertaking R&D of a non-industry specific nature.

Drawing on the latter approach, an alternative to the current arrangements would be to channel some, or all, of the government funding currently provided to the existing RDCs on a matching basis, into a new RDC responsible for sponsoring non-industry specific rural R&D. This would leave the industry-based RDCs solely or more heavily reliant on levy funds, but with a commensurately reduced obligation to sponsor broader research.

This particular approach was canvassed by a few participants. (See, for example, CSIRO, sub. 123; Industry and Investment NSW (IINSW), sub. 69; Victorian Catchment Management Authority, sub. 101.) However, other approaches were also suggested:

- quarantine a proportion of the government funding for each of the existing RDCs to be used by them for public benefit research. (See, for example, IINSW, sub. 69; AECL, sub. 119; Department of Agriculture, Fisheries and Forestry (DAFF), sub. 156.) In effect, this would involve giving wider application to the approach already employed within RIRDC and the FRDC
- place this quarantined funding in a separate pool and allocate it through a contestable process, either on an ‘open to all comers’ basis, or limited to the RDCs alone. (See, for example, University of Sydney, sub. 53; University of Adelaide, sub. 55; IINSW, sub. 69; Group of Eight, sub. 105)
- create a single new RDC responsible for all industry-specific and broader research, with this broader research being a component of each of three

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industry-based research streams within the new entity (Agricultural Research Development Education and Planning, sub. 108)

- separate the RDC model into ‘functional’ streams, with sector-based RDCs responsible solely for sponsoring R&D, and new RDCs created to facilitate the adoption of those research outputs and practice change, and to perform marketing functions (Corporate Development Institute, sub. 151).

As a means to increase the degree of additional research induced by the government funding contribution — and thereby to get better value for the community from that contribution — the Commission is not attracted to the latter three approaches.

- A separate quarantined funding pool, allocated on a contestable basis, would suffer from the same sorts of difficulties as a more generalised, departmentally managed, contestable regime (see previous section). Indeed, if the pool could be accessed by any research supplier meeting the relevant requirements, rather than simply limited to the RDCs, the only difference from a generalised contestable regime would be the amount of funding involved.
- Creating a super RDC — or as some characterised it in discussions, ‘an RDC on steroids’ — would not of itself address the current tensions arising from the differing research requirements of the two main stakeholders in a situation where the funding contributions from each are pooled. There would also be some obvious costs and general risks of putting all of the RDC eggs into one basket. Amongst other things, the loss of individual industry identity within such a mega body might — like any attempt to significantly rebalance the existing RDCs’ portfolios towards non-industry specific research — threaten the stability of levy funding. (The observations of the Australian Wool Growers Association (sub. 73, p. 4) are illustrative of this.)
- Creating new extension and marketing-specific RDCs, and leaving the existing RDCs to focus solely on R&D, would not directly influence the degree of additionality in the research work. Moreover, the Commission considers that such functional separation, and especially between R&D and extension activity, would be intrinsically undesirable. As emphasised frequently in this report, facilitating the adoption of research results must be an integral part of R&D project planning. Thus, formally separating the two, and then seeking to bring them back together through some sort of collaborative process, would be a risky and almost certainly retrograde step.

The approaches of creating a new government-funded RDC responsible solely for non-industry specific research, or requiring each RDC to spend a pre-determined part of its public funding on such research, have more to commend them. In effect, both would unbundle funding for industry-specific and more general rural R&D,

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and thereby diminish the tensions that currently arise for the RDCs in seeking to balance the different requirements and expectations of the Government and levy payers. The two approaches would also continue to harness most of the strengths of the current RDC model — and, in particular, the capacity to call on an accumulated bank of expertise and to draw on well developed linkages to industry in procuring and managing specific projects. In addition, the better alignment of research tasks and funding sources could:

- facilitate more effective engagement of levy payers and the Government in helping to set RDC priorities
- increase the incentives for the two key stakeholders to monitor how well their respective contributions were being spent.

That said, the worth of the outcomes delivered would depend in large part on the amount of public funding earmarked for non-industry specific R&D and the rules governing its expenditure. For example, using the option of a separate new RDC for illustrative purposes:

- If the criteria for the expenditure of funds were very highly prescribed by the Government, and thus the scope for the new RDC to bring particular expertise to bear in project selection were severely curtailed, it would in effect become simply a contract manager. Though there might be some efficiencies to be gained relative to a departmentally managed, contestable, allocation process, all of the costs and risks of government prescription would remain.
- If the degree of prescription was lower, but the level of public funding made the new entity heavily dependent on leveraging additional contributions from other parties, then the degree of research additionality induced by the government contribution might not be particularly high. In particular, if the new entity were heavily dependent on top-up funding from private sources or industry-based RDCs, then the focus of its project portfolio might not be greatly different from that of a collective, industry-specific, RDC.
- Conversely, without any funding linkages to industry, one of the key strengths of the current model would be lost. In addition to increasing the risk of investment in projects of limited social value, the absence of any direct industry stake in research outcomes could make the new entity more vulnerable to short term budgetary pressures.

Similar, though not identical observations, would apply to the alternative approach of requiring that a part of each of the existing RDCs' government funding be used for non-industry-specific research.



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Even so, finding a sweet spot between these competing considerations is not, in the Commission's view, an unachievable goal. Certainly, the two approaches appear to have some important advantages compared with the alternatives.

As to the relative merits of the two approaches, there are again some competing considerations.

- On the one hand, as the GRDC (sub. 129, p. 36) observed, quarantining government funding for broader rural R&D within the existing RDCs could make it easier to realise synergies with industry-specific research. It might also make it easier to harness relevant input from industries and would provide immediate access to a bank of research management expertise.
- On the other hand, there will be potentially important across-industry synergies in this sort of broader rural research that would ostensibly be easier to capture were a single entity responsible for the entirety of the work. In fact, the nature of the research in question suggests to the Commission that these synergies are likely to be more significant than those arising from the interface with industry-specific R&D. The Commission further notes that as LWA has only recently ceased operations, its research legacy and some of its previous management expertise could most probably be quite quickly mobilised within any similar new entity.

More generally, creating a separate new entity would largely obviate any possibility that industry pressure could inappropriately skew the nature of the broader research work undertaken. 'Ring fencing' arrangements may well be sufficient to address concerns about the combination of R&D and marketing responsibilities within the industry-owned corporations (see chapter 8). However, the Commission is less certain that such arrangements could be relied upon to ensure that the interests of levy payers did not encroach unduly on broader research sponsored by an RDC which also retained responsibility for funding industry-specific R&D. From a monitoring perspective, identifying any instances where this had happened would likely be harder than identifying situations where public funding provided for R&D had been diverted into marketing activities.

Similarly, a separate non-industry RDC would most probably be better able to cater for the different extension needs that can attach to broader rural research. Pressure from levy payers is again likely to encourage industry-specific RDCs to focus their extension activities on the adoption of research that provides a direct benefit to those levy payers. However, for broader rural research — especially in the environmental area — primary producers may have limited direct financial incentives to adopt new practices that would be of considerable benefit to the wider community. A separate, government-funded, RDC could provide resources to

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facilitate such practice change, and build the necessary supporting internal expertise in these sorts of extension matters, unencumbered by competing claims from levy payers.

## **Relying on the general R&D tax concession**

Perhaps the biggest change that could potentially be made to the current arrangements would be to retain the levy system, but end the matching government contribution and instead give primary producers access to the general R&D tax concession for their levy payments. A similar approach is used to fund coal research (see sub. 56).<sup>2</sup>

A key in-principle effect of the approach would be to more closely align the level of government assistance for this component of rural R&D with that for most privately funded research elsewhere in the economy. Currently, the matching contribution regime affords levy payers a considerably higher level of support (see chapter 7).

At face value, any change that reduced disparities in levels of assistance for R&D across the economy would have some benefits. In particular, many research inputs are not specific to individual industries or sectors, at least over the medium to longer term. For example, many scientists could potentially work in a range of industries. Equality of assistance will help to ensure that research resources are employed where they deliver greatest value for the community. Conversely, disparities in assistance can have similar resource costs to those that arise when particular industries are protected by tariffs.

Moreover, the lower level of government assistance would arguably be more in keeping with the potential benefits for the wider community from contributing to the cost of the R&D likely to be sponsored within an industry-specific RDC regime. That is, as discussed earlier, with levy arrangements in place to help address free-rider problems, the Commission's judgement is that a government contribution is only likely to buy modest amounts of additional research.

However, other considerations militate against using the tax concession approach.

- As discussed in the next chapter, some distinctive characteristics of the rural sector, in combination with imperfections in the levy system as a means to

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<sup>2</sup> At present, levy payments are a deductible business expense, but are generally excluded from the tax concession. According to DAFF (sub. 156, p. 40), this is because a levy payer does not 'control' the R&D or 'own' the research results. Hence, were such an approach to be pursued, legislative changes to address this exclusion and some other rural specific considerations (see text) might be required.

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overcome free-rider problems, may provide a rationale for *somewhat* higher government support for industry-specific R&D than in other parts of the economy.

- As several participants pointed out, the R&D tax concession is only available to registered incorporated entities with research expenditures of more than \$20 000 a year. Hence, R&D investments by the many sole operators, trusts, partnerships and smaller corporate entities in the rural sector would not currently be eligible. (See for example, MLA, sub. 106 and GRDC, sub. 129). In addition, the current definitions of eligible R&D spending for tax concession purposes would further limit the access of primary producers. As well as issues relating to the particular eligibility of R&D-related levy payments (see footnote 2), DAFF (sub. 156, pp. 40-41) observed that the general definitions of eligible R&D for tax concession purposes are more stringent than those for expenditure that qualifies for matching government contributions under the RDC arrangements.
- Even with changes to improve the access of primary producers to the tax concession, the immediate and major reduction in government support that the approach would entail would be highly problematic on transitional grounds.

It would be possible to address all of these issues through introducing a rural-specific R&D tax concession — a suggestion made by a few participants (for example, subs. 17 and 115). But this would call into question the basis for moving to the tax concession approach in the first place — namely equality of treatment with other sectors.

Also, the current government contribution to the RDCs is at least partly intended to facilitate broader, non-industry specific, rural R&D. A general, non-prescriptive, tax concession for rural R&D spending, no matter how big, would not do this. Thus, even putting aside all of the other problems, the tax concession approach would not be a stand-alone means for achieving good outcomes for the community as a whole.

### **6.3 A modified RDC model would be the best approach**

While the RDC model as currently configured has some shortcomings, these need to be viewed in the context of the model's strengths. As the preceding discussion indicates, these strengths are particularly relevant in looking at the likely outcomes from alternative ways through which the Government could provide its current funding for the RDCs. In the Commission's view, it is highly unlikely that an alternative which did not involve at least some element of the current co-investment approach would deliver as good an outcome for the community.

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Indeed, to justify a fundamental change in approach, the alternative would have to offer the prospect of a considerably better, rather than only a marginally better, outcome. There would likely be significant transactions costs — especially if it took a long time to replicate the research expertise that currently resides within the RDCs in a new investment vehicle. Also, there is always a risk that policy changes may have unintended outcomes.

In the Commission’s judgement, the case for retaining core elements of the broad RDC model is therefore very strong.

That said, as the RDC model is currently configured, the very sizeable government contribution does not appear to be buying a significant amount of additional R&D. Moreover, if the large majority of that contribution continues to be bundled with funding from industry levies, it is likely to be difficult to substantially increase the benefit derived by the community from its investment through the model.

The Commission therefore concludes that a change to the broad configuration of the RDC model is warranted. For the reasons spelt out in section 6.2, it considers that the best approach would be to use some of the government contribution to fund a new RDC tasked with investing in the sort of broader rural research that is likely to be under-provided by industry-specific RDCs. Though not a perfect solution, it would nonetheless redirect some public funding to research and extension areas where that funding would most likely add greater value — and without the need for the Government to tightly prescribe the nature of the activities undertaken.

This approach might be construed as little different from recreating LWA. For good reason, the new RDC would have many parallels with that entity. Virtually all of those involved in the rural R&D area consider that LWA made a very valuable contribution and that its abolition was a retrograde step (see box 6.2). By all accounts, LWA provided a means to involve industry in the selection of broader cross-sectoral research projects; brought considerable project management expertise to the table; and, like the industry-specific RDCs, helped to directly facilitate the uptake of research outputs and/or provided the linkages to other extension service providers. Most importantly, the nature of LWA’s project portfolio suggests that the amount of additional research induced ‘per dollar’ of government funding was considerably higher than for most of the industry-specific RDCs. Indeed, LWA’s demise seemingly reflects the fact that its research portfolio was not tied to the needs of particular industries, meaning that there was no strong constituent base to defend it in the face of pressure to deliver budgetary savings.

However, what the Commission is proposing goes well beyond simply reversing that decision.

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## Box 6.2 Views on the contribution of LWA

The most significant issue facing the model is the loss of a coordinating point for natural resource research after the removal of [LWA]. (IINSW, sub. 69, p. 16)

One area that could be improved is in the linkage between production and natural resource management which was previously filled by [LWA]. As the current system of levy arrangements is ... production based there is now no strong vehicle for linking production and environmental research to practical on farm management that takes in both the farm and the wider landscape impacts of farming. (Growcom, sub. 122, pp. 12-13)

Environmental/natural resource management research was encouraged by the former [LWA] which by attracting co investment from the production based [RDCs] led to a heightened awareness of NRM issues among those RDCs. ... [LWA's abolition] was a particularly short-sighted decision in the light of much wider awareness of environmental issues including drought and climate change now extant in the farming and general communities. (AIAST, sub. 12, p. 25)

The RDCs provide a valuable tool for engaging across sectors which is stymied by the current model, particularly with the closure of [LWA] and the budget cuts in [RIRDC]. ... [These changes have also] reduced the support for social research ... This would appear to be inconsistent with the government's broader rural policy approach ... [and] with the broader Government objective of delivering public goods into society. (Australian National University, sub. 43, p. 4)

The Australian Government recently abolished [LWA], a research funding body that concentrated on broader environmental issues facing all farmers. The research outputs are recognised as providing vital information for farmers to farm sustainably whilst preserving soil, water and vegetation resources. (Environmental Farmers Network, sub. 47, p. 2)

The axing of [LWA] ... and the lack of a clear articulation from government of how the subsequent 'gap' would be managed has resulted in a lack of leadership in agricultural water use efficiency management across the sector. (Cotton Australia, sub. 68, p. 22)

... the abolition of LWA would have to stand as a pinnacle of poor public policy. (Australian Land Management Group, sub. 103, p. 7)

First and foremost, the Commission envisages that the new RDC would have a wider remit than LWA which was focussed on R&D related to the productive and sustainable management of land and water resources. In particular, the new entity should also be responsible for sponsoring non-industry specific R&D into energy provision and use within the rural sector — in effect, picking up the rural component of the former ERDC. Especially, in the context of pressure for greenhouse gas abatement, there are likely to be many opportunities for socially valuable energy-related research which will not fit neatly within the research portfolios of the industry-specific RDCs.

There may also be opportunities to embody research functions and (funding) that are either currently performed by other bodies, or might in future be so if there is no non-industry-specific RDC to call on.

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- Several participants discussed issues relating to funding for, and the conduct of, future irrigation research — especially in the light of the recent cessation of the CRC for Irrigation Futures and the impending end to the National Program for Sustainable Irrigation (see box 6.3).
  - RIRDC currently receives a special funding appropriation for its ‘National Rural Issues’ research stream. A considerable part of the R&D supported within this stream seemingly relates directly to sustainable resource management — for example, research directed at improving agricultural productivity and addressing food security and climate change issues (see RIRDC 2010).
  - Some research funded through Australian Government departmental programs in areas such as climate change and weeds reduction might be more effectively funded and delivered through the proposed new RDC. In fact, the Commission understands that the former LWA received considerable additional public funding through such departmental programs, with the investment of some of that funding now being ‘supervised’ by the GRDC (sub. 129, p. 23).
  - As alluded to in chapter 5, the new RDC could also conceivably play some role as a funder and custodian of information and other building blocks for future rural research.

However, these possibilities should be viewed as illustrative rather than definitive, with other ‘topic’ areas canvassed in submissions including: native vegetation; nutrient use efficiency; salinity and other soil-related issues; pasture issues; biodiversity in terrestrial and aquatic environments; and tropical agriculture. Thus, at this stage, rather than being very prescriptive about the remit of the proposed new RDC, the Commission is instead seeking further input from participants with a view to providing more definitive guidance in its final report.

That said, the Commission is strongly of the view that the remit of the new RDC should *not* extend to the broader fisheries research currently conducted by the FRDC. This research, which is linked to the sustainable management of aquatic resources and funded via a general appropriation from the Government, transcends the individual industries that comprise the fisheries sector. Nonetheless, it still has a strong sectoral emphasis and is therefore most appropriately the responsibility of a sector-specific organisation.

Retention of these research functions within the FRDC was also strongly supported by participants from the fisheries sector. For example, the Commonwealth Fisheries Association said that:

The CFA strongly supports the continuation of FRDC as the coordinating provider of RD&E for Commonwealth fisheries. Any consideration of centralising government funding initiatives would devalue the important role of FRDC within the fishing

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industry and may result in a counterproductive outcome for the industry and the Australian community. (sub. 102, p. 2)

### **Box 6.3     Irrigation research issues**

With Australian Governments having embarked on an ambitious rural water reform agenda, R&D directed at improving irrigation technology and management is of considerable importance. Significantly, much of this sort of research is not crop-specific, suggesting that there should be a strong cross-sectoral dimension to any irrigation R&D.

This cross-sectoral dimension is, to at least some extent, reflected in current institutional and funding arrangements. For example:

- Since 2002, more than \$18 million of irrigation research has been funded under the National Program for Sustainable Irrigation (NPSI) — a collaboration between several RDCs (including, until 2009, the former LWA), water companies/authorities and government agencies (sub. 70).
- The National Primary Industries RD&E framework initiative includes a cross-sectoral stream ‘Water use in agriculture.’

However, several participants expressed concern about the future of irrigation research in Australia, including in regard to:

- the absence of a peak body to coordinate this research, with Cotton Australia (sub. 68, p. 22) noting that the coordinating role was formerly undertaken by LWA
- the recent cessation of the CRC for Irrigation Futures, which was responsible for conducting much of the previous research
- the funding vacuum that will arise when the NPSI ends in June 2011
- the restricted coverage of the ‘Water use in agriculture’ cross-sectoral RD&E stream.

One submission (sub. 6, p. 3) also questioned the effectiveness of some of the irrigation research sponsored by the Murray Darling Basin Authority.

The NPSI and Irrigation Australia have developed a framework for future irrigation RD&E which canvasses a range of funding vehicles, including both joint venture approaches and a new RD&E institution (see subs. 70 and 90). The framework proposes an enduring joint venture approach to succeed the NPSI, arguing against a new institution on the grounds of establishment costs and uncertainties about the extent of linkages with industry and investors.

However, a new non-industry RDC would be another option (see text), especially in light of the role played by the former LWA.

The second major difference in the Commission’s proposal compared to the previous LWA regime is that the creation of the new non-industry RDC would be

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accompanied by a gradual reduction in government funding for the existing industry-specific RDCs.

This is not to downgrade the very important role that these RDCs have played, and should continue to play, in enhancing the productivity and competitiveness of the industries concerned. Nor is to suggest that the activities of industry-specific RDCs do not merit some public funding support.

However, for the reasons outlined above, the industry-specific RDCs are never likely to be a particularly effective vehicle for facilitating research that is primarily of benefit to non-levy payers — or even research where the benefits are spread across a wide range of levy paying industries. Therefore, the Commission's judgement is that their activities do not warrant the very significant level of public funding that is currently provided.

In effect, the Commission is proposing that the industry-specific RDCs focus on the interests of their levy payers and receive a level of public funding more in keeping with that role. It notes that the removal of any obligation to go beyond industry-focused research would seem to be in keeping with the desired role of at least some of the current RDCs. Thus, the AMPC pointed to:

... the importance of ensuring RDC-IOCs continue what they do best — R&D, innovation, extension and industry services to advance sustainable productivity of enterprises and the sector. (sub. 111, p. 50)

At the same time, the Commission emphasises that such a focus would not obviate the need for industry-specific RDCs to collaborate with their counterparts and other research entities. As many of the current RDCs clearly recognise, even for industry-focused work, collaboration will often be a means to improve research quality and to allow for investment in larger, potentially game changing, projects.

The Commission's specific funding proposals for the new RDC and the industry-specific RDCs are set out in the next chapter.

## **Some key requirements for the new RDC**

Whatever the precise remit of the new RDC and the level of government funding that would be appropriate given that remit, the entity should be established and operate on the following basis.

It should be created as a statutory corporation under the PIERD Act and be badged in a way that both clearly differentiates it from the former LWA and effectively signals the wider range of research that it will be funding and managing. In the



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Commission's view, 'Rural Research Australia' (RRA) would be appropriate for this latter purpose.

In the first instance, funding for RRA would come from the Australian Government in the form of an annual appropriation. RRA would then, like the other RDCs, be able to augment that appropriation through drawing in funding from other public and private sources. However, the annual appropriation from the Government should be provided under a quadrennial funding agreement — as is also the case for several other government-funded research organisations, including the CSIRO, the Australian Institute of Marine Science and the Australian Nuclear Science and Technology Organisation. Importantly, quadrennial funding would leave RRA less exposed to any short term budgetary pressures on the Government and thereby help to promote continuity in its research program and greater certainty for its research providers.

In accordance with the current requirements of the PIERD Act, the RRA board appointed by the Minister should provide access to a range of skills commensurate with the entity's research funding and management functions. Also, in keeping with the Commission's proposed change to generally applicable RDC board arrangements, there should be scope for RRA to seek the appointment of a 'government director' if it perceives that this would complement other board skills and/or improve dialogue with the Government (see draft recommendation 8.4).

As to the designated industry bodies for consultation and board selection committee purposes, the choice will depend to some extent on the ultimate remit of RRA. Suffice to say that the broadly-based bodies that were designated for LWA — such as the National Farmers' Federation and the Australian Conservation Foundation — would be among the list of possibilities. But whatever the specific choices made, the Commission stresses that RRA's consultations should not be limited to the designated bodies. As discussed in chapter 8, there should be an onus on all RDCs to demonstrate that they have consulted with an appropriately wide range of relevant stakeholders.

### **Implications for the governance of the industry-specific RDCs**

In a very broad sense, there could reasonably be some trade-off between the level of public funding for the industry-specific RDCs and the accountability demands imposed on them by the Government in return for that funding. That is, if the Government's contribution were very small, it would be hard to justify a costly set of governance requirements to ensure that public funds were properly spent.

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However, the Commission's funding proposals (see chapter 7) would see the industry-specific RDCs continue to receive a very substantial government contribution. In these circumstances, there should reasonably be mechanisms in place to help ensure that this contribution is making a difference to the type of research being conducted.

As outlined in chapter 8, the Commission has therefore spelt out a range of principles that the RDCs should comply with in return for their government funding; several of which are explicitly concerned with governance arrangements. It is also proposing a small number of complementary specific changes — including the aforementioned provision for the consensual appointment of a 'government director' to an RDC's board.

## **Provision for review**

The Commission's recommended changes to the configuration of the RDC model, and to the associated funding arrangements, are significant. Moreover, even though it is proposing that government funding for the industry-specific RDCs be reduced gradually to give levy payers plenty of time to adjust to the new funding environment (see draft recommendation 7.1), there are necessarily some uncertainties about how the arrangements might play out. It would therefore be prudent to make provision for a review that could provide the basis for further modifications if required. The Commission's specific review proposals are set out in chapter 9.

### **DRAFT RECOMMENDATION 6.1**

***The Australian Government should retain a modified Rural Research and Development Corporation (RDC) model.***

- ***It should establish and fund a new RDC, 'Rural Research Australia' (RRA) to sponsor non-industry specific R&D intended to promote productive and sustainable resource use by Australia's rural sector.***
  - ***RRA's remit should broadly encompass land, water and energy use, with the precise coverage of its activities determined having regard to the further input to this inquiry.***
  - ***As part of that coverage decision, consideration should be given to the benefits and costs of bringing the 'national rural issues' R&D that is currently the responsibility of the Rural Industries RDC within the new entity.***

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- *However, RRA’s remit should not extend to the sector-specific ‘public good’ research undertaken by the Fisheries RDC.*
  - *RRA should be created as a statutory R&D corporation under the Primary Industries and Energy Research and Development Act 1989 (Cwlth).*
    - *It should be funded by an annual appropriation from the Australian Government under a quadrennial funding agreement.*
    - *RRA should be able to supplement its appropriation from the Australian Government with funding from other sources, including from other RDCs.*
  - *Following the establishment of RRA, the other RDCs — except for the Fisheries RDC — should focus predominantly on sponsoring R&D of direct benefit to their levy payers.*
  - *In consequence, the funding contributions from the Australian Government for all of the existing RDCs, except for the Fisheries RDC, should be gradually reduced (see draft recommendation 7.1).*



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## 7 Future government funding of RDCs

### Key points

- Government funding for the RDC program should be commensurate with the expected benefits to the community, and provided in a way that delivers maximum value.
- An annual appropriation of around \$50 million would (after a five-year phase in) ultimately be warranted for the proposed Rural Research Australia (RRA) to undertake non-industry-specific R&D. Additional funding should be provided for any research responsibilities transferred to RRA from other programs.
- The current rate of government contributions to industry-specific RDCs is between three and eleven times what non-rural industries receive through R&D tax incentives. While rural industries have some unique features, these do not justify such a disparity:
  - the primary focus of industry-specific RDCs has been, and is likely to remain, on applied R&D where benefits to rural producers are significant
  - concerns that rural industries underinvest in R&D because there are many small enterprises using similar, readily copied, production methods are, to a significant extent, addressed by compulsory R&D levies.
- Government contributions to the industry-specific RDCs would have to fall by as much as 90 per cent to achieve parity with the R&D assistance provided to most non-rural industries. However, such a large reduction would be inappropriate due to the resulting adjustment costs, and imperfections in the effectiveness of the levy system in addressing all reasons why rural industries might underinvest in R&D.
- The Commission instead proposes that the caps on matching government contributions to industry-specific RDCs be halved to 0.25 per cent of the gross value of production (GVP), with this reduction phased in over ten years. The Fisheries RDC already has such a cap, and so there would be no change in its case.
- The proposed changes, including the creation of RRA, would broadly maintain the Government's total funding for the RDC program in the first five years, and still provide a sizeable amount of support in the longer term.
- To the extent that current public funding of industry-specific RDCs has induced additional R&D, there will be some reduction in total expenditure on rural research, especially in the short term. However, shifting some funding into a well-managed portfolio of broader public-interest R&D (through RRA), where communitywide benefits should be higher, will increase the return to the community per dollar of support.

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In chapter 6, the Commission outlined the reasons why it considers that the broad model for Rural Research and Development Corporations (RDCs) should be retained, although with modifications. In essence, the Commission is proposing that greater responsibility be placed on rural producers to fund the type of R&D generally undertaken by the industry-specific RDCs, while the Australian Government puts more emphasis on supporting broader public-interest R&D via a new RDC called Rural Research Australia (RRA).

This chapter considers how much the Australian Government should contribute to funding the industry-specific RDCs and RRA. Key steps in the analysis are an assessment of the current level of public funding for the industry-specific RDCs (section 7.1), and why this is not the best use of taxpayers' money (section 7.2). The Commission's specific funding proposals are then presented, along with consideration of the likely impacts (section 7.3), followed by an assessment of whether there is any case for explicitly redistributing support between the industry-specific RDCs (section 7.4).

## 7.1 Current levels of support

In its 2007 study of public support for science and innovation, the Commission found that government contributions to the RDCs were very generous compared to the financial assistance generally provided for R&D in other sectors (PC 2007). This remains the case.

The principal means by which the Australian Government currently assists R&D outside the rural sector is through tax incentives (Australian Government 2010; DIISR 2010).<sup>1</sup> The Government has proposed changes to the R&D tax incentives (discussed below), but they currently comprise a:

- 'basic' tax deduction of 125 per cent for R&D expenditure
- 'premium' tax deduction of 175 per cent for R&D expenditure on items other than plant that is above the claimant's average annual R&D spending in the last three years
- refundable R&D tax offset for small companies, especially those recording a loss for tax purposes, so they can 'cash out' the basic and premium tax concessions.

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<sup>1</sup> Tax incentives are expected to account for 76 per cent (\$1606 million) of science, research and innovation support provided directly to the 'business enterprise sector' (including agriculture, forestry and fishing) by the Australian Government in 2010-11 (DIISR 2010). Other significant support to firms will be via the Automotive Competitiveness and Investment Scheme (6 per cent, \$137m), Green Car Innovation Fund (5 per cent, \$103m), Automotive Transformation Scheme (2 per cent, \$52 million), and Commercialisation Australia (2 per cent, \$32 million).

At a 30 per cent company tax rate, the basic (125 per cent) tax concession provides a subsidy of around \$8 for every \$100 of net (post-tax incentive) industry contributions to R&D (table 7.1). Similarly, the premium (175 per cent) concession provides around \$29 per \$100 of net industry contributions. In comparison, matching government contributions to the industry-specific RDCs averaged \$91 per \$100 of industry contributions over the period 2000-01 to 2008-09 (table 7.2). In other words, the rate of government contributions to the RDCs was between three and eleven times the support available to non-rural industries through the R&D tax concessions. This probably understates the relative generosity of assistance for rural R&D because the RDCs face a less restrictive definition of eligible R&D than do companies under the tax concessions.

**Table 7.1 Comparison of government contributions via tax incentives and RDC funding**

	<i>Government contribution per \$100 of net industry contribution<sup>a</sup></i>	<i>RDC contribution relative to tax incentive</i>
	\$	multiple
<b>Current R&amp;D tax concessions</b>		
Basic (125%)	8.11	11
Premium (175%)	29.03	3
<b>Proposed R&amp;D tax offsets</b>		
Turnover ≥ \$20m (133%)	10.99	8
Turnover < \$20m (150%)	17.65	5
<b>Matching contributions to RDCs<sup>b</sup></b>	91.03	na

<sup>a</sup> Net industry contribution after deducting any tax benefit provided through the R&D tax concessions or offsets (since such tax benefits are effectively government contributions to R&D). For example, at a 30 per cent company tax rate, the tax benefit amounts to 7.5 per cent of gross (pre-tax incentive) R&D expenditure under the basic (125 per cent) tax concession ( $0.30 \times 0.25$ ), and so gross R&D expenditure of \$108.11 is required to achieve a net industry contribution of \$100 ( $100 / \{1 - 0.075\}$ ). <sup>b</sup> Based on government and industry contributions to the RDCs over the period 2000-01 to 2008-09. Further details provided in table 7.2. **na** Not applicable.

Source: Productivity Commission estimates.

The above estimates assume that rural producers face the same 30 per cent tax rate as companies receiving the tax concessions, and so the standard tax deduction they can claim for R&D levies and R&D expenditure respectively has no bearing on the disparity in assistance. If rural producers had a lower tax rate, the Government would forgo less revenue from the tax deductibility of R&D levies, and so the relative generosity of the RDC model would be less than indicated above. Conversely, if rural producers had a higher tax rate, the RDC model would be more generous than indicated.

**Table 7.2 Australian Government contributions to the RDCs per \$100 of industry contributions, 2000-01 to 2008-09<sup>a</sup>**  
Dollars

RDC	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	Average 2000-01 to 2008-09
<b>Statutory RDCs<sup>b</sup></b>										
Cotton RDC	98	120	101	185	94	73	110	160	103	116
Fisheries RDC <sup>c</sup>	378	236	340	271	151	150	162	170	171	225
Grains RDC	65	65	60	62	56	71	70	49	49	61
Grape and Wine RDC	83	89	90	96	84	88	109	115	88	94
Rural Industries RDC <sup>d</sup>	240	205	262	337	236	225	130	218	231	232
Sugar RDC	100	90	82	96	69	89	109	105	118	95
<i>Average (statutory RDCs)<sup>e</sup></i>	<i>127</i>	<i>106</i>	<i>118</i>	<i>119</i>	<i>88</i>	<i>95</i>	<i>99</i>	<i>90</i>	<i>84</i>	<i>103</i>
<b>Industry-owned corporations</b>										
Australian Egg Corporation	na	na	na	152	101	94	100	72	84	101
Australian Pork Ltd	116	106	84	114	111	100	93	100	89	101
Australian Wool Innovation <sup>f</sup>	25	27	27	33	32	29	25	41	50	32
Dairy Australia <sup>g</sup>	91	102	104	95	67	62	79	109	132	93
Forest & Wood Products <sup>h</sup>	41	82	80	81	79	81	100	80	104	81
Horticulture Australia	90	115	95	95	104	96	113	100	97	101
Meat and Livestock RDCs <sup>i</sup>	100	100	101	100	100	100	100	100	100	100
<i>Average (industry-owned RDCs)<sup>e</sup></i>	<i>73</i>	<i>79</i>	<i>74</i>	<i>82</i>	<i>81</i>	<i>78</i>	<i>82</i>	<i>90</i>	<i>96</i>	<i>82</i>
<b>Average (all RDCs)<sup>e</sup></b>	<b>98</b>	<b>92</b>	<b>93</b>	<b>98</b>	<b>84</b>	<b>85</b>	<b>89</b>	<b>90</b>	<b>90</b>	<b>91</b>

<sup>a</sup> Excludes contributions for marketing, promotion and industry representation; and indirect support via publicly-funded research providers not fully recovering their costs from the RDCs (chapter 5). Industry contributions are the amounts received by RDCs after the Australian Government deducts its fee to cover the costs of collecting industry levies. Collection costs averaged less than 1 per cent of levies in 2008-09 (chapter 9). <sup>b</sup> Excludes funding for non-industry-specific R&D sponsored by RIRDC and the recently-abolished LWA. <sup>c</sup> The Government makes significant unmatched contributions for fisheries R&D due to its responsibility to manage a 'common property' resource (fisheries) on behalf of the community. <sup>d</sup> Industry-specific R&D managed by RIRDC. <sup>e</sup> Individual years are a weighted average, with the weight for each RDC being its share of combined government and industry contributions for the relevant group of RDCs in that year. <sup>f</sup> Industry contributions to R&D in 2007-08 and 2008-09 derived from a combined marketing and R&D levy according to the allocation of levies supported by wool growers in the 2006 Woolpoll. <sup>g</sup> Industry contributions estimated by subtracting government contributions from R&D expenditure, due to no information being available on how the combined marketing and R&D levy was allocated between those functions. <sup>h</sup> Industry contributions to R&D in 2008-09 derived from a combined marketing and R&D levy according to how expenditure was divided between those functions. <sup>i</sup> AMPC, LiveCorp and MLA. These RDCs were combined in the table because the Government matches industry contributions to AMPC and LiveCorp by providing funds to MLA, due to MLA commissioning R&D on behalf of the other two RDCs. Industry contributions to AMPC and LiveCorp that did not pass through MLA are excluded. **na** Not applicable.

*Sources:* Productivity Commission estimates based on data published in RDC annual reports and operating plans, and unpublished information provided by the RDCs and Australian Government Department of Agriculture, Fisheries and Forestry.



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However, even if rural producers were exempt from paying tax, the support provided through the RDC model — \$91 per \$100 of industry contributions — would still be more generous than the support that has been provided to other industries through R&D tax concessions and standard deductions. The basic (125 per cent) tax concession, combined with a standard deduction at a 30 per cent tax rate, results in the Government forgoing revenue of \$60 per \$100 of net (post-tax) industry expenditure on R&D (since gross pre-tax expenditure of \$160 attracts a total deduction, inclusive of the 125 per cent concession, of \$60, resulting in a net contribution of \$100). The figure would obviously be higher were the premium (175 per cent) concession used, but only a small minority of companies receiving the R&D tax incentives have been eligible for the premium concession, due to its stricter eligibility requirements (ATO 2010).

The Australian Government has proposed changes to the R&D tax incentives. Under this proposal, government support for eligible R&D would become equivalent to a tax deduction of 133 per cent for entities with a turnover of at least \$20 million, and 150 per cent for other entities (box 7.1). As a result, the government subsidy offered per \$100 of net (post-tax incentive) industry expenditure on R&D would amount to \$10.99 for entities with a turnover of at least \$20 million, and \$17.65 for other entities (table 7.1). Matching government contributions to the RDCs over the period 2000-01 to 2008-09 (91 per cent of industry contributions) were therefore between five and eight times higher than what would be offered under the proposed new tax incentives. The multiple of around five times is likely to be the most relevant because rural producers typically have an annual turnover of less than \$20 million. Again, this ratio will understate the true disparity in assistance to the extent that RDCs face a less restrictive definition of eligible R&D than businesses do under the proposed tax incentives. As noted in box 7.1, it appears that the proposed tax incentives would involve an even stricter definition of eligible R&D than under the existing tax concessions.

In contrast to the above estimates, some participants claimed that the RDC program and tax concessions provide a similar rate of assistance for R&D. However, this conclusion appears to be the result of calculation methods that cause the disparity in assistance to be significantly understated (box 7.2).

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### Box 7.1      **Proposed changes to tax incentives for R&D**

The final report of the Review of the National Innovation System (Cutler review) recommended that R&D tax concessions be replaced with tax credits (Cutler 2008). The Government accepted this recommendation and subsequently proposed a tax-offset scheme for expenditure on eligible R&D activities.

The rate of the proposed tax offset, and whether it is refundable, would depend primarily on the aggregate turnover of the entity undertaking R&D. Specifically, there would be:

- a refundable 45 per cent tax offset — equivalent to a tax deduction of 150 per cent — for entities with an aggregate turnover of less than \$20 million (unless they are a tax-exempt entity or majority owned or controlled by tax-exempt entities)
- a non-refundable 40 per cent tax offset — equivalent to a tax deduction of 133 per cent — for all other entities.

Non-refundable tax offsets can only be used to reduce a tax liability. Where the amount of tax owed in a given year is less than a non-refundable offset, the unused portion of the offset can be carried forward to offset tax in future years. In contrast, the Government would pay a cash refund for the unused portion of a refundable tax offset.

The Government also accepted the thrust of the Cutler review's recommendation to tighten the definition of R&D eligible for tax incentives. This was reflected in the latest exposure draft of the proposed legislation for the tax offsets, which was released by the Commonwealth Treasury for public comment in March 2010. It contains a new definition of R&D and tightened eligibility for supporting activities, compared with the rules for the current R&D tax concessions. The criteria for determining whether R&D is eligible for the proposed tax offsets would also seem to be considerably more stringent than those used for matching government contributions to the RDCs.

*Sources:* Cutler (2008); Treasury (2010).

Another way of quantifying the relative generosity of public support between sectors is to compare actual government outlays per unit of industry activity. Gross value of production (GVP) — the measure of industry activity typically used to set caps on government contributions to the RDCs (chapter 2) — would not be appropriate for this purpose. This is because it would involve double counting of outputs, since goods produced in one industry, such as grains, are often embodied in the value of outputs produced by others, such as grain-fed beef. A better approach is to compare public support relative to value added — the value of an industry's output *minus* the value of inputs sourced from other industries.

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### **Box 7.2      An alternative view on the disparity in assistance**

In their written submissions, Across Agriculture (sub. 116) and Dairy Australia (sub. 130) claimed that the RDC program and tax concessions provide a similar rate of assistance for R&D. The Commission sought further information from them on how they reached this conclusion, and has formed the view that the estimation methods used by the participants cause the relative generosity of the RDC arrangements to be significantly understated (Across Agriculture detailed its calculations in sub. 163). In particular:

- It seems that Dairy Australia measured the rate of assistance by the size of public funding support relative to total R&D expenditure. This measure includes public support in both the numerator and denominator, creating a downward bias in the estimated rate of assistance. This downward bias increases with the level of public support, and so is greater for the (highly-assisted) RDC program than the (less generous) tax concessions. The rate of assistance should instead be measured by public support relative to the industry's net contribution to R&D, since the purpose of support is to increase R&D beyond the amount funded by industry.
- A similar issue applies to Across Agriculture's calculations, which effectively used the ratio of total R&D expenditure to industry contributions to measure the financial incentive provided by public support.
- Dairy Australia included the standard tax deduction that non-rural industries can claim for R&D expenditure in its assistance calculations for the tax concessions and offsets. In contrast, the standard tax deduction that rural producers can claim for R&D levies was excluded from assistance calculations for the RDC model.
- It appears that the share of R&D that has qualified for the more generous premium tax concession was significantly overestimated by Dairy Australia, thereby considerably overstating the average level of support provided by the tax concessions. Data released by the ATO (2010) show that only a small minority of companies have received the premium tax concession, due to stricter eligibility requirements.
- Across Agriculture excluded a sizeable proportion of government contributions to the RDCs on the grounds that they fund 'public good' R&D that delivers no benefit to rural producers. As discussed in chapter 6, such research appears in fact to have been very much a minor part of existing RDCs' research portfolios.
- Across Agriculture effectively assumed that rural producers cannot claim a tax deduction for the portion of industry levies used to fund RDC overheads. In contrast, the tax deduction that firms can claim for R&D-related overheads under the tax incentives and offsets was included.

The Commission estimates that, in 2008-09, direct government contributions to the RDCs were equivalent to 0.74 per cent of value added in the agriculture, forestry and fishing industries. In contrast, government outlays on the R&D tax concessions provided to other industries are estimated to have been equivalent to 0.13 per cent

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of their value added.<sup>2</sup> That is, the rate of government contributions to RDCs per unit of rural value added was around six times what non-rural industries received per dollar of value added in government outlays from the tax concessions.

A similar calculation based on the proposed new tax incentives indicates that, in terms of assistance per unit of value added, 2008-09 government contributions to RDCs were between four and six times what non-rural industries would have received per dollar of value added in government outlays under the proposed tax incentives.<sup>3</sup>

The above discussion overlooks the indirect subsidies for RDC-funded research that arise when publicly-funded research providers do not fully recover their costs, as well as the considerable amount of government support for rural R&D provided outside of the RDCs, such as to CSIRO and universities. Non-rural industries also receive indirect subsidies through the activities of publicly-funded agencies, the precise magnitude of which is unknown. However, it is implausible that the RDCs would be receiving a much lower rate of indirect support than the rest of the economy, given the substantial public funding of rural research providers.

Therefore, the available data leave little doubt that rural R&D funded by the RDCs receives a far higher overall (direct and indirect) rate of assistance than R&D conducted across the economy as a whole. A few other industries — particularly motor vehicles and textiles, clothing and footwear — would also receive a relatively high rate of assistance for their R&D, but this is not an appropriate benchmark.<sup>4</sup> As the Commission has previously argued, the high rate of assistance provided to those industries imposes a net cost on the community as a whole (PC 2008a, 2008b).

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<sup>2</sup> Based on 2008-09 government contributions to the RDCs of \$218 million (chapter 2); government support to all industries under the R&D tax concessions of \$1.3 billion (DIISR 2010); non-rural industries undertaking more than 98 per cent of R&D eligible for the tax concessions (Innovation Australia 2009); and value added of \$29.6 billion in agriculture, forestry and fishing, and \$1035.3 billion in non-rural industries (ABS 2009).

<sup>3</sup> This assumes that all R&D that qualified for tax concessions in 2008-09 would also have qualified for the proposed tax offsets. On this basis, the tax offsets are estimated to provide support to non-rural industries equivalent to between 0.13 and 0.20 per cent of their value added, depending on the turnover of claimants.

<sup>4</sup> In absolute terms, the automotive sector receives among the largest industry-specific programs for science, research and innovation. Such assistance for textiles, clothing and footwear would be significant relative to the industry's value added.

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## 7.2 Can the current level of support be justified?

In theory, a mathematical model could be used to estimate the optimal government support for rural R&D, and hence determine whether the current level of assistance is appropriate (for example, Esposti and Pierani 2006). However, many questionable assumptions would have to be used to implement such an approach, given the limited information on critical factors like the time lag between R&D and its benefits, and the counterfactual (chapter 3). A further major limitation would be the significant deficiencies in Australian data on the amount, and funding sources of, rural R&D. Hence, a mathematical model would convey a false impression of precision and yet be of little practical use in calibrating public support for rural R&D.

The Commission has therefore drawn on a range of largely qualitative evidence to assess whether current government support for the RDCs is reasonable. Some of this evidence — such as the type of R&D being undertaken and the returns captured by producers — has been considered in earlier chapters. This section draws together that information with the assistance estimates presented in section 7.1. Ideally, those estimates would include total (direct and indirect) public funding support of the RDCs but, as noted previously, reliable data on indirect support are not currently available.

In order to justify the relatively generous rate of government funding support for the RDCs, it would be necessary to establish that, compared to assisting other sectors, such support generates a commensurately greater rate of return to the community as a whole. This would require more socially-worthwhile R&D to be induced per dollar of assistance (a higher rate of ‘additionality’). The distinct characteristics of rural industries, and associated R&D ‘spillovers’, are often cited as reasons why there is a high rate of additionality. These characteristics are considered below.

### Characteristics of rural industries

Rural industries are often characterised as comprising many small enterprises that use similar, readily-observable, production methods. It could be argued that this makes underinvestment in research a greater problem in the rural sector because:

- Industries dominated by small enterprises are less likely to invest in R&D, since the minimum funding required to make an R&D project viable is beyond the capacity of individual producers.

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- The use of similar, readily-observable, production methods means that innovations by one producer can often easily be copied by others, making it particularly difficult for an innovator to recoup its investment.

However, the existence of small enterprises and easily-copied production methods can largely be addressed by the use of compulsory industry levies to fund collective R&D, as occurs under the existing RDC arrangements (chapter 3). That is, the overall cost of R&D can be spread across a large number of small producers so that the return each receives generally outweighs the cost they bear, and ‘free riding’ on the efforts of others is significantly curtailed.

It should also be noted that it is inaccurate to characterise rural industries as always comprising small enterprises using similar, readily-observable, production methods. The forestry and meat processing industries, for example, mainly comprise large enterprises that potentially have sufficient scale to recoup the cost of larger R&D projects and in some cases protect the intellectual property associated with innovations. Even in rural industries where there are many small family-owned producers, such as broadacre agriculture, there are also a number of much larger enterprises that can and do undertake some R&D outside of the RDC system (Corporate Agriculture Group, sub. 134).

Commercial fishing is perhaps the only case where industry characteristics clearly justify a significantly higher rate of public support. Governments are often responsible for managing fisheries because they are a ‘common property’ resource owned by the community. For this reason, a higher rate of government contributions is provided to the Fisheries RDC (FRDC) than to its counterparts in other industries, and a large part of those contributions do not have to be matched by industry. Specifically, FRDC receives matching government contributions that are capped at 0.25 per cent of fisheries GVP, and an additional amount equivalent to 0.50 per cent of GVP that is not linked to levy payments (FRDC 2009).

### **Characteristics of rural R&D spillovers**

Another argument put forward to justify a high level of public support for rural R&D is that, even with a levy system in place, many of the benefits of such research ‘spill over’ to others outside the industry. As noted in chapter 3, such spillovers could accrue to:

- other industries, both within and outside the rural sector
- the wider community.

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Inter-industry spillovers can occur because innovations developed for one rural industry — such as improved fertiliser and irrigation techniques — are often applicable to other rural industries. Spillovers to non-rural industries are also possible, such as from safer methods of handling chemicals. Health, environmental and animal-welfare improvements are among the spillover benefits that can arise for the wider community.

However, spillovers do not necessarily deter investment in R&D (chapter 3). The return that an innovator receives may still be sufficient to justify an investment, irrespective of any spillovers to other parties. As noted in chapters 4 and 5, much of the R&D sponsored by RDCs is directed at improving productivity and has clearly provided direct benefits to rural producers. This has led the Commission to conclude that government contributions are likely to have induced only modest additional R&D in total. Moreover, the Commission considers that it would be difficult to significantly increase additionality within the current governance and industry-specific nature of existing RDCs, at least without involving the Government in detailed project planning.

Nor does the Commission consider that the inter-industry spillovers that can attach to rural R&D provide a basis for significantly higher support. Where returns to a single industry are insufficient, RDCs can and do undertake collaborative research with others (chapter 4).

Rural industries often make greater direct use of natural resources than other sectors, and so it could be argued that rural R&D generates relatively large spillover benefits for the wider community. Dairy Australia (sub. 130), for example, highlighted a range of environmental benefits from dairy R&D, such as improved water quality and reduced greenhouse gas emissions. However, as noted in chapter 3, rural producers often have a strong incentive to fund R&D that improves environmental outcomes. For example, farmers can directly benefit from innovations that conserve water and decrease soil erosion. Where it is not in a producer's direct financial interest to take account of wider environmental impacts, this could potentially be addressed through regulation and taxes. If it is difficult to do this efficiently or effectively, then funding relevant research through the proposed new RRA or broader programs is likely to be more effective than expecting industry-specific RDCs to do so, given their focus on research that provides direct benefits to levy payers.

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## Overall assessment

The implication of the preceding discussion is that, while the rural sector has some distinctive features, and its R&D does generate spillovers, this does not justify a rate of government support for industry-specific rural R&D that is between three and eleven times what other sectors receive through tax concessions. A lower rate of assistance commensurate with the seemingly modest overall degree of additionality associated with government contributions to industry-specific RDCs would be more appropriate.

Greater reliance on industry funding for the existing RDCs would be consistent with the original intention of the RDC model when it was introduced to the Parliament in 1989:

The Government expects the new corporations to improve the adoption of research results. This should demonstrate the benefits of increased R&D funding. In turn this should encourage industry to increase levies beyond the level which attracts matched grants from the Commonwealth.

Commonwealth contributions should ideally be seen as seed money to encourage industry contributions. (Brown 1989, p. 1403)

Similar sentiments were expressed by the relevant Ministers prior to drafting the relevant legislation (Kerin and Cook 1989).

A greater role for the private sector in funding the RDCs would also bring Australia closer to the situation in other developed economies. While it is difficult to precisely determine how Australia's public support for rural R&D compares to other countries, data published by the OECD (2009) suggest that it is relatively generous. In terms of public funding per unit of GVP, Australian support is over twice the comparable figure for the United States, 1.4 times that for Canada, and almost three times that for New Zealand. In making these comparisons, the Commission recognises that the OECD data appear to have deficiencies. For example, the data for Australia seem to exclude government contributions to ten out of the fifteen RDCs, and support is measured relative to GVP rather than value added. Nevertheless, in the absence of evidence that these deficiencies significantly bias public-funding relativities between countries, they are at least suggestive that funding support from the Australian Government is generous in an international context.

However, as the preceding observations only relate to the industry-specific RDCs, a different set of considerations arise in determining the appropriate funding level for the proposed RRA (discussed below). Moreover, while the Commission is strongly of the view that the current level of government support for the industry-specific



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RDCs is too high, there are both efficiency and transitional reasons for not removing all the current disparity with support provided for R&D in most other parts of the economy. These reasons are outlined below.

### **7.3 The Commission's specific funding proposals**

As set out below, the Commission considers that an annual appropriation of around \$50 million would (after a five-year phase in) ultimately be warranted for RRA, supplemented by additional funding for any research responsibilities transferred from other programs. The Government should also continue to provide funding to the industry-specific RDCs, with its matching contributions linked to those made by rural producers. It is proposed, however, that the caps on matching government contributions be gradually reduced over ten years to 0.25 per cent of GVP. As such a cap already applies to FRDC, there would be no change for that entity.

The proposed package would broadly maintain the Government's total funding of the RDC program in the first five years, and still provide a sizeable amount of support — around \$165 million based on 2009-10 rural GVP — in the longer term.

#### **Funding of RRA**

The appropriate funding level for RRA will depend on the precise remit it is given. As discussed in chapter 6, the Commission has at this stage left this open to further input to this inquiry.

However, a useful benchmark against which to determine an appropriate budget for RRA is the former Land and Water Australia (LWA), which had expenditure of almost \$40 million in 2007-08 (LWA 2009). As outlined in chapter 6, the Commission envisages that RRA would have a broader mandate than LWA, including research on rural-related energy issues. In addition, RRA could potentially take on some of the rural-related R&D currently occurring outside the RDC arrangements. For example, some rural-related climate change research and natural resource management programs run by government departments might be more efficiently managed by RRA.

The Commission has therefore concluded that RRA should have a significantly higher annual budget than LWA's 2007-08 expenditure of \$40 million. What this translates into in terms of direct government contributions to RRA depends on the extent of leveraging. In 2007-08, direct government contributions to LWA only amounted to around one-third (\$13 million) of its expenditure. However, the Commission considers that such a high rate of leveraging would not necessarily be

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appropriate for RRA. In particular, it poses the risk that RRA's research projects would have a greater industry-specific focus than would be desirable for a body meant to undertake non-industry-specific rural R&D.

In light of these coverage and leveraging considerations, the Commission's judgement is that an appropriation from the Government of around \$50 million a year would ultimately be warranted for RRA. As noted in chapter 6, this funding should be provided through a quadrennial funding arrangement. Direct government contributions of this magnitude, combined with a more modest amount of leveraging with funds from other sources, could potentially make RRA the second-largest RDC (in terms of R&D expenditure) after the Grains RDC. However, it would clearly take some time for RRA to gear up a research portfolio commensurate with government funding of this magnitude. Thus, its funding appropriation should be progressively increased to the target level over a period of five years.

That said, the Commission reiterates that the appropriate funding level for RRA will depend on the precise remit it is given, meaning, for example, that a somewhat greater amount would be appropriate were it to assume research responsibilities that are currently funded through other programs.

### **Support provided to industry-specific RDCs**

The Commission considers that, with levy arrangements in place to help prevent free riding on industry-focused R&D, and RRA established to fund broader rural R&D, the case for gradually reducing government contributions to the industry-specific RDCs would be strong.

In its 2007 study of public support for science and innovation, the Commission concluded that the appropriate reduction in government funding for the industry-specific RDCs would best be determined by case-by-case assessments of the spillovers induced by that support (PC 2007). As discussed in chapter 4, the RDCs have subsequently undertaken a program of *ex post* evaluations of their R&D investments (CRRDC 2010). This has highlighted difficulties in precisely quantifying induced spillovers, particularly in relation to environmental and social benefits. Moreover, it seems unlikely that underlying methodological issues will be easy to overcome, meaning that there would necessarily be a high degree of imprecision in employing the approach suggested in the 2007 report. Such an approach could also add considerably to the roughly \$2 million currently spent

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annually by RDCs to participate in the cross-sectoral evaluation program sponsored by the Council of Rural Research and Development Corporations (CRRDC).<sup>5</sup>

Accordingly, the Commission is now of the view that seeking to explicitly link reduced funding to case-by-case assessments of induced spillovers, though conceptually sound, would be expensive, slow and inevitably subject to judgement. Therefore, more approximate metrics for calibrating future funding levels seem to be the only practical way forward.

Continuing the approach used in section 7.1, one method would be to benchmark government contributions to the RDCs against R&D assistance provided to other sectors. If the induced R&D per dollar of assistance were broadly the same for rural industries as other sectors, there would be a strong case for providing the same rate of support. To achieve parity with the rate of R&D support that other sectors receive through tax concessions, government contributions to the RDCs would have to be reduced by as much as 80 to 90 per cent.<sup>6</sup>

However, the Commission considers that such a significant cut in support would be inappropriate for at least three reasons:

- Several factors are likely to detract from the effectiveness of the levy mechanism in addressing free-rider problems and the resulting underinvestment in industry-focused rural R&D (chapter 3).
- A funding cut of 80 to 90 per cent, especially if it occurred quickly, could generate high adjustment costs. There is a risk that rural producers would respond by significantly reducing their levy contributions to the RDCs, despite evidence that they receive high returns from the R&D funded by those contributions. Hence, the stability of the whole RDC model, which the Commission considers to have many benefits, might be threatened. Even without this sort of response by producers, a very significant and immediate reduction in public funding might still lead to a loss of human capital and expertise from the research community, which would take a long time to restore.

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<sup>5</sup> CRRDC (2009) noted that participating RDCs have generally been allocating around 0.5 per cent of their total annual budgets (of around \$500 million) to this purpose.

<sup>6</sup> The Commission estimates that the rate of government contributions to the RDCs has averaged between three and eleven times what other industries are offered per dollar of net industry contributions under the tax concessions (section 7.1). This implies that government contributions to the RDCs would need to be cut by between 68 to 91 per cent to equalise rates of support across sectors. Similarly, government contributions to the RDCs per dollar of rural value added are around six times what non-rural industries have received in government outlays per dollar of value added from the tax concessions. This implies that government contributions to the RDCs would need to be reduced by about 80 per cent to achieve parity.

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- The adjustment costs associated with cutting support to the RDCs would add to those arising from other funding changes. For example, there are likely to continue to be ongoing pressures on state and territory governments to contain the costs associated with their rural R&D programs. Furthermore, it may become increasingly difficult to secure funding for rural R&D under the cooperative research centres (CRCs) program (chapter 2).

Taking all of these factors into account, the Commission proposes that the cap on matching government contributions to industry-specific RDCs be gradually halved to 0.25 per cent of GVP. There is already a GVP-based cap of 0.25 per cent on matching government contributions to FRDC, and so there would be no change in its case. The unmatched government funding provided to FRDC would also be unaffected, consistent with the recommendation in chapter 6 that FRDC retain its current ‘public good’ research functions.

RIRDC’s appropriation for industry-specific R&D should also be reduced. However, a distinction needs to be made between industries that pay an R&D levy and those that only make voluntary contributions. For industries paying a levy to fund RIRDC, the cap on matching government contributions should be phased down to 0.25 per cent of that industry’s GVP, as proposed for the industry-specific RDCs.

For industries that only make voluntary contributions to RIRDC, it has been the policy of RIRDC to generally match those contributions up to a cap of \$300 000 per annum. The size of matching contributions relative to industry size has varied considerably between industries, but collectively amounted to only about 0.03 per cent of GVP in 2008-09 (table 7.3). Reducing this support could obviate the scope to fund meaningful R&D. The Commission therefore considers that RIRDC’s appropriation should enable it to maintain the current overall level of matching contributions for industries that only make voluntary contributions.

As recommended in chapter 6, the Government should also consider transferring RIRDC’s broader public-good research, and the associated component of its funding appropriation, to RRA.

Under the Commission’s proposal, levy payers would still receive a significantly higher rate of public support for R&D sponsored through industry-specific RDCs than those investing in R&D elsewhere in the economy. If matching government contributions to the industry-specific RDCs, and the industry-specific component of RIRDC, had been halved in 2008-09:

- The rate of government contributions to the RDCs per dollar of industry contributions would have been between two and six times the rate of support offered under the current R&D tax concessions.<sup>7</sup>
- Direct government outlays on the RDCs per dollar of rural-industry value added would have been almost three times government outlays on the current tax concessions per dollar of non-rural industries' value added.

**Table 7.3 RIRDC's matching of voluntary industry contributions, 2008-09**

<i>Industry</i>	<i>GVP</i>	<i>Matching contribution as a percentage of GVP</i>
	\$m	%
Essential oils and plant extracts	12	1.74
Fodder crops	2 256	0.01
Horse	3 600 <sup>a</sup>	0.01
Native foods	7	1.07
Olives	67	0.44
Tea Tree	18	1.12
Wildflowers and native plants	40 <sup>b</sup>	0.41
Total	6 000	na
Weighted average <sup>c</sup>	na	0.03

<sup>a</sup> 2005-06. <sup>b</sup> 2006-07. <sup>c</sup> Weighted by GVP in the relevant industries. **na** Not applicable.

Source: RIRDC.

### *Phasing in of funding changes*

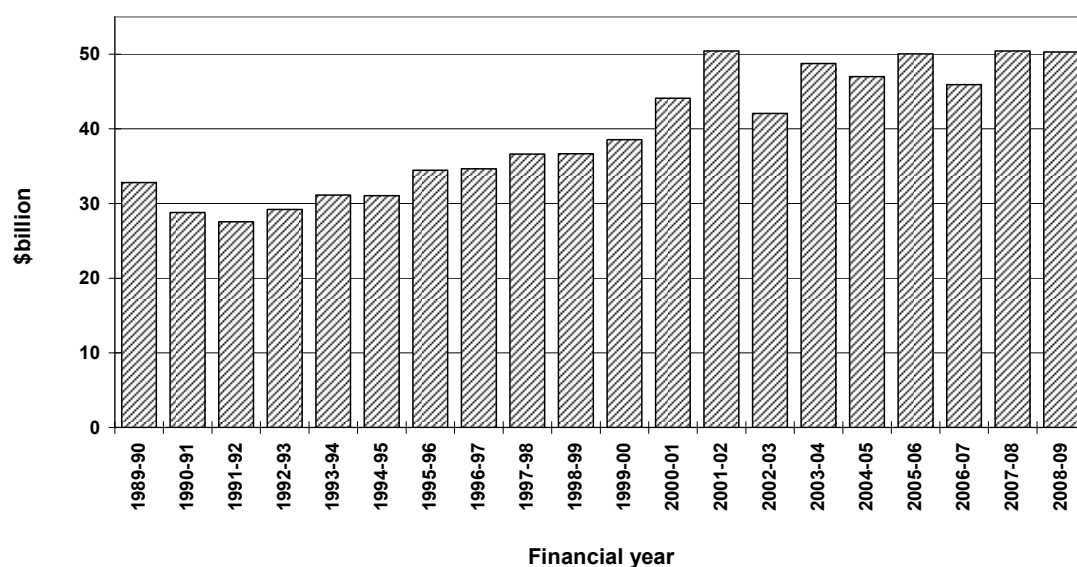
One way to gradually phase in the reduction in public funding for industry-specific RDCs might be to hold the dollar amount of government contributions at their current level, and allow the effects of inflation and industry growth to erode the rate of support over time. However, if there is little growth in rural GVP — as has been the case over most of the last decade (figure 7.1) — there would not be any appreciable reduction in the rate of support.

Even if rural GVP resumes a long-term upward trend, holding government contributions constant in dollar terms would still probably involve a very gradual decline in the rate of support per unit of industry activity. For example, if future

<sup>7</sup> The equivalent estimate based on the proposed new tax offsets would be between three and four times, depending on the turnover of entities claiming the offset.

annual GVP growth was 3 per cent, it would take about 25 years to reduce government contributions from 0.50 to 0.25 per cent of GVP. This would be a much longer transition period than appears warranted to accommodate adjustment concerns.

**Figure 7.1 Gross value of agricultural production, 1989-90 to 2008-09<sup>a</sup>**



<sup>a</sup> Measured in current prices (not adjusted for inflation).

Data source: ABS (2009).

The Commission considers that a better approach would be to gradually phase the reduction in over a period of ten years. A ten-year transition period would significantly reduce the likelihood that reduced government contributions could destabilise the RDC model, and/or exacerbate adjustment costs associated with funding adjustments elsewhere in the rural R&D system. An extended phase-in period is also justified because it will take time to adjust existing research portfolios, and for levy payers or other sources of private funding to fill some of the gap left by the reduced contribution from the Government.

As outlined in chapter 9, a review following the ten-year phase-in period could, among other things, assess the outcomes from reduced government support, and reconsider relative rates of R&D assistance between sectors in the light of developments in rural and other industries.

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## What are the likely impacts?

As detailed below, for the first five years of the proposed new arrangements, the Commission's proposals would primarily involve a reallocation of the Government's funding of the RDC program. That is, progressively greater funding for RRA would effectively offset lower funding for the industry-specific RDCs, meaning that the Government's overall contribution to the RDC program would be broadly unchanged. Moreover, the Commission expects that the reduction in total government funding, once the new arrangements are fully in place, would be at least partly offset by rural producers increasing their funding of industry-focused research. As outlined below, there are already examples of such research occurring outside the RDC program with little or no public funding.

More importantly, the change in overall public funding is not a good indicator of how the wellbeing of the community as a whole would be affected. The current arrangements involve very large subsidies for research that rural producers would often have sound financial reasons to fund themselves. Subsidies of this nature are intrinsically no less wasteful than other instances of poorly targeted public spending. Through a reduction in the subsidies for industry-focused R&D of direct benefit to rural producers, together with the creation of the RRA to fund the sort of broader rural research that has been underprovided to date, the Commission's package would better align the benefits received and the costs incurred by the various parties. Thus, notwithstanding the decline in total public funding support for the RDC program, the community as a whole would be better off.

### *Government contributions to the RDCs*

The impact of the proposed reform package on the Government's overall funding of the RDC program would depend on future rural GVP, and the precise remit of, and funding for, RRA.

In 2009-10, the GVP-based caps on matching government contributions to the RDCs totalled about \$220 million, excluding around \$5 million for FRDC (DAFF, Canberra, pers. comm., July 2010) which would be unaffected by the Commission's proposal. Thus, halving the caps for RDCs other than FRDC would have delivered savings of around \$110 million per annum by the end of the ten-year phase in. Based on 2009-10 production levels, this would amount to lowering the aggregate cap at the start of each year by \$11 million for a period of ten years.

If RRA's funding were built up to the indicative \$50 million target over five years, then the Government's overall contribution to the RDC program would effectively be maintained for that period (since it would take five years to lower the caps on

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government contributions to industry-specific RDCs by \$55 million per annum, based on 2009-10 GVP).

At the end of the ten-year phase down, the Government's overall contribution to the RDC program would be around \$60 million a year lower — a \$110 million reduction for existing RDCs offset by a \$50 million appropriation for RRA — excluding any additional funding accompanying the transfer of research functions to RRA from other programs. However, the still sizeable amount of support — up to \$165 million a year for all RDCs — would be more in keeping with the likely benefits to the wider community from contributing to a program of this nature.

### *Industry contributions to the RDCs and other rural R&D*

Inquiry participants generally contended that a reduction in direct government contributions to the RDCs would lead to a decline in rural R&D spending because other funding sources would not fill the gap (for example, Australian Biosecurity Cooperative Research Centre, sub. 29; Cattle Council of Australia, sub. 83; NSW Department of Industry and Investment, sub. 69).

Across Agriculture (sub. 116) claimed that private-sector rural R&D is a complement rather than a substitute for research funded by the public sector. It based this assertion on the observation that US agricultural productivity growth has slowed in recent years despite substantial growth in private-sector rural R&D.

In addition, the CRRDC (sub. 128, p. 5) was concerned that making 'the RDCs more heavily dependent on levy funds would ... fragment research effort and increase pressure to limit RD&E to areas oriented directly toward on-farm productivity'.

It seems likely that in the short term there would be a reduction in industry-specific rural R&D of similar magnitude to the proposed cut in government contributions to industry-specific RDCs. Among other things, levy rates are difficult to adjust quickly, even if there is evidence of a potentially high payoff for producers from this sort of research.

However, the Commission's expectation is that only relatively low-yielding projects would be permanently dropped, and over the longer term there would be a strong case for rural producers or other private funders to fill much of the gap left by the Government. This is especially the case as the *ex post* evaluations coordinated by the CRRDC (2010) suggest that RDC projects have very significant productivity and other direct benefits for levy payers. Moreover, those evaluations also suggest



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that the bulk of projects would have proceeded without matching government contributions, albeit perhaps in a reduced form or at a slower pace (chapter 4).

The Commission agrees that public funding can be used to support research that is complementary to privately-funded R&D. Indeed, that is the reason why RRA has been proposed. However, for reasons outlined earlier, the Commission's judgement is that, given the nature of research sponsored by the industry-specific RDCs, much of the current government contribution is substituting for private funding rather than complementing it.

Similarly, with RRA created to fund broader rural R&D, a continued heavy emphasis, or even a greater emphasis, by the industry-specific RDCs on productivity-focused work would not of itself be a cause for concern.

The Commission recognises that it will take time for the mindset of rural producers to change, as they have grown accustomed to a system in which there is a very high rate of public assistance for rural R&D. However, the Commission is confident that rural producers, like those in other industries, can and will fund R&D where there is an obvious benefit to them, especially with an industry levy in place to limit 'free riding' on the efforts of others. Indeed, there are already examples of Australian rural producers willing to fund R&D that receives little or no public funding support (box 7.3). In addition, the Victorian Department of Primary Industries (sub. 161) noted examples — for canola and potatoes — where it had, with prior notice, signalled its intention to withdraw from funding some near-to-market R&D, and the private sector had taken over responsibility for the relevant programs.

It is notable that other developed economies invest, on average, in rural R&D at a broadly similar rate of intensity as Australia, but with much less reliance on funding from the public sector (chapter 2). Provided the Australian Government makes it clear that a reduced rate of public assistance will continue into the future, the Commission does not see why Australian rural producers should be less inclined to invest in rural R&D than their counterparts in other developed countries.

That said, to the ostensibly modest extent that public funding support for the RDCs has previously induced additional research, a reduction in that support would most probably result in some long-term decline in the amount of rural R&D.

However, as noted earlier, it is likely that the projects expected to yield relatively low benefits would be those most affected. Moreover, the Commission reiterates that R&D expenditure levels alone are not a reliable measure of the benefit generated for the community as a whole. The Commission's proposal would effectively involve shifting around half of the savings from reduced public funding for industry-specific RDCs into broader public-interest R&D where, with the right

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management and efforts to ensure adoption, the resulting communitywide benefits should be higher. The end result would be a higher return to the community per dollar of support, even if total funding support and the overall level of rural R&D declines.

**Box 7.3 Australian examples of rural R&D funded primarily by industry**

In the sugar industry, BSES Limited was established in 2003 as an R&D body owned by cane growers and millers. It was formed from the previous Bureau of Sugar Experiment Stations, a Queensland Government agency that was created in 1900, based in large part on industry levies, and had been funded by the sugar industry for many years. BSES Limited relies on voluntary fees paid by cane growers and millers. These accounted for 58 per cent (\$13.6 million) of its revenue in 2008-09. A further 17 per cent (\$4.0 million) of its revenue came from Queensland Government research grants, and 19 per cent (\$4.5 million) from other research grants (including from the Sugar RDC) (BSES Limited 2009).

In Western Australia, various private farmer groups have been established to adapt innovations to local conditions. These entities are funded by voluntary private subscriptions and are typically of a small scale. They fill a niche that would be difficult for the RDCs, with their national mandate, to cater for.

The South Australian Grains Industry Trust (SAGIT) is a comparatively small program established in 1991 to fund grains-related R&D in South Australia (SA). SAGIT is essentially funded by a voluntary levy paid by grain growers in that state. Very few SA grain growers have opted not to pay the levy, which is set by the relevant Minister each year on the advice of the SA Farmers' Federation after consideration at its annual general meeting. The SA grains industry has supported several increases in the levy since it was first introduced at a rate of 10 cents per tonne. The levy was set at 25 cents per tonne for the 2009-10 season. SAGIT invests around \$1.2 million per year on about 30 R&D projects (SAGIT, sub. 11).

In Tasmania, the private sector funds most of the R&D for pharmaceutical poppies and salmonoid marine farming (Tasmanian Department of Primary Industries, Parks, Water and Environment, sub. 148).

Individual private enterprises also conduct rural R&D without receiving public support, other than through the R&D tax incentives available to all sectors. This is probably most prominent among larger businesses, due to the scale of the projects they can finance (for example, Auscott Limited, sub. 5). The Grains Council of Australia (sub. 45) noted that a large proportion of investment in grains plant breeding is now done by private companies.

The Commission further notes that were the Government to decide that a larger total public contribution to the RDC program would be appropriate, it would become even more important that a sizeable part of that contribution was used to create and fund RRA. Put another way, whatever the total public funding commitment, using

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that funding solely to support the activities of industry-specific RDCs is highly unlikely to provide the best return to the community.

DRAFT RECOMMENDATION 7.1

*The Australian Government should contribute to the cost of rural R&D sponsored by the Rural Research and Development Corporations (RDCs) on the following basis:*

- *There should be direct appropriations for the proposed new RDC, Rural Research Australia (RRA); for ‘public-good’ research sponsored by the Fisheries RDC; and for ‘national rural issues’ research sponsored by the Rural Industries RDC (RIRDC), unless responsibility for this research is transferred to RRA (see draft recommendation 6.1).*
- *The appropriation for RRA should be progressively increased over five years to around \$50 million a year, with additional funding provided for any research responsibilities transferred to the new entity from other programs (see draft recommendation 6.1).*
- *The Australian Government should continue to link its funding for the industry-specific RDCs to contributions made by the industries concerned.*
  - *However, the cap on matching contributions for all statutory levies should be reduced from 0.50 per cent to 0.25 per cent of an industry’s gross value of production (GVP). This reduction should be phased in over ten years, with the cap reducing by 0.025 per cent of GVP each year during this period.*
  - *The appropriation for RIRDC should allow it to continue to match voluntary industry contributions at the current level.*

INFORMATION REQUEST

*The Commission seeks further input on the appropriate remit and funding for the proposed Rural Research Australia (RRA) and, in particular, on:*

- *areas and types of non-industry-specific rural R&D that would be relevant to promoting productive and sustainable resource use by the sector*
- *opportunities to beneficially consolidate funding and management of research that is currently the responsibility of other entities within this new Research and Development Corporation*
- *whether \$50 million a year, plus additional funding for any research responsibilities transferred from other programs, would be a reasonable target for the government appropriation for RRA having regard to:*
  - *the desirable breadth of the entity’s research remit*

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- *the extent of unmet, socially valuable, research needs within that remit*
  - *the appropriate degree of leveraging for an entity of this nature*
  - *the rate at which RRA's funding appropriation could reasonably be increased towards the target level.*

## **7.4 Distribution of support across industry-specific RDCs**

The Commission also considered whether redistributing support between industry-specific RDCs could add to the benefits from the Government's funding contribution. Three potential mechanisms are considered below:

- vary the rate of government contributions according to the type of R&D undertaken
- regularly redistribute support across industry-specific RDCs to reflect changes in government priorities and expectations about individual industries
- provide an additional 'loading' on government contributions for R&D in emerging and/or small industries.

However, as the discussion below makes clear, the Commission has concluded that such explicit redistribution of support between RDCs would not be appropriate.

### **Vary support according to type of R&D**

In theory, it might be possible to improve the value generated by government contributions to the industry-specific RDCs by varying the rate of contributions according to expected rates of additionality. Thus, the greater the induced R&D expected, the more support an RDC would attract. Possible proxies that might be used for this purpose could include:

- novelty and risk associated with the R&D, similar to the eligibility criteria used for the R&D tax incentives
- topic of the R&D, with greater support provided where the research subject matter is generally thought to have higher spillovers, as might possibly be the case for environmental and social research
- extent to which R&D expenditure exceeds that of previous years, similar to one of the eligibility tests used for the current premium (175 per cent) tax concession.

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However, the administration and compliance costs of the first and second of these proxies would be very high, given the large variety of projects that RDCs sponsor and the judgement required to assess novelty or risk. In this regard, the Australian Superfine Woolgrowers Association (sub. 9) noted that it would be difficult to develop an acceptable funding formula to reflect differences between RDCs. Alternatively, if more broad-brushed interpretations were used, then there might be little change in the current funding distribution across RDCs.

Using increases in R&D spending from one year to the next as an indicator of additionality would be similarly inappropriate. The expenditures of the RDCs are largely a function of legislated levies received from producers, and those levy rates could not practically be adjusted on an annual basis. In addition, effectively providing a higher rate of matching contributions in years when levies increase and a lower rate when levies decline would exacerbate the volatility that commodity cycles already impose on RDC revenues.

### **Vary support according to government priorities and expectations**

Another option would be to regularly redistribute support across the industry-based RDCs to reflect changes in government priorities and expectations relating to individual industries. Government priorities might, for example, include reducing water use in a particular industry, and its expectations could reflect perceptions of which industries have the greatest potential for future growth. Along similar lines, the Tasmanian Department of Primary Industries, Parks, Water and Environment suggested that:

The Australian Government's funding allocations across RDCs ... should be based on an assessment of the real contribution each RDC makes to the future value and the longer term competitive prospects of particular industries against triple-bottom-line outcomes, including contribution to the Australian (and regional) economy, food security, lifestyle, and sustainable natural resource management. (sub. 148, p. 21)

This approach would reward favoured issues and industries at the expense of others, and so its potential to make the overall community better off depends on the wisdom and foresight of the Government in targeting the 'right' areas. As discussed in chapters 3 and 5, such 'winner picking' has some very significant drawbacks, which is why the Commission favours retention of the RDC model rather than some of the alternatives.

It should also be noted that existing arrangements already have an in-built mechanism for redistributing R&D support from declining to growing industries. In particular, as an industry expands or contracts, its changing output levels will tend

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to be reflected in changes to levy collections, and hence in matching government contributions.

### **Loading for emerging and/or small industries**

Some participants argued that underinvestment in rural R&D is a particular problem for emerging and small industries, and so a greater level of public funding support should be provided for their R&D (for example, Australian Olive Association, sub. 97; Australian Tea Tree Industry Association, sub. 79). However, as discussed in chapter 3, the Commission does not consider this to be an intrinsically strong argument for varying the rate of assistance for rural R&D.

The Commission has proposed that the overall level of funding provided to RIRDC to match voluntary contributions from (typically small or emerging) industries be maintained. However, there would be a range of practical problems with attempting to implement a more general loading for small and emerging industries. For example, there would be a need to determine a cutoff point below which an industry was defined as being small or emerging, the appropriate size of the loading; and what criteria would be used to differentiate between emerging winners and industries destined to remain small or fail.

Apple and Pear Australia Ltd (APAL) expressed similar concerns about attempting to pick winners or discriminate in favour of emerging industries:

... APAL does not support a situation where government contributions differ on the basis of an industry having high growth potential, a greater potential for productivity improvement or on the basis of whether they are emerging rather than mature industries. Inevitably such distinctions force governments to pick ‘winners and losers’, a task for which government is ill equipped. In addition to the complex equity and efficiency issues associated with such discrimination, governments would also face difficult practical issues such as how ‘maturity’ or ‘emerging’ are defined and to determine the differential rates that might apply. (sub. 86, p. 13)

More broadly, the Commission questions the wisdom of a tops-down effort to engineer better ‘strategic’ outcomes. As discussed in chapter 5, the focus of funding support should be on additionality. Overlaying this with notions that particular industries are more or less worthy of support, and then adjusting funding formulae to try to favour those industries, could easily deliver worse, rather than better, outcomes, for the community.

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## 8 Supporting changes to the RDC model

### Key points

- A wide range of detailed changes could be made to the RDC model to try to provide better outcomes, but this would complicate the broader model design and funding reforms that the Commission is proposing.
- The Commission therefore considers that supporting changes to the RDC model should focus primarily on:
  - a common set of principles that attach to government funding and the discharge of the Government's responsibilities
  - a small number of specific changes to support those principles, including to strengthen monitoring of outcomes and promote more effective enforcement of the requirements associated with government funding.
- The proposed specific changes are that:
  - the role of public funding support for the RDC program should be more clearly articulated in relevant legislation and funding agreements
  - Ministerial involvement in priority setting and approving RDCs' plans should be removed, except for the Fisheries RDC and proposed Rural Research Australia
  - statutory RDCs should be allowed to undertake marketing activity, provided it is wholly funded by industry
  - RDCs should have the option to request a government-appointed director to improve board skills and facilitate communication with the Government
  - all RDCs should be formally required to participate in a cross-RDC project-evaluation process
  - every RDC should be required to have an independent performance review at least every three years
  - the Government should publish an annual monitoring report for the RDCs as a group.
- Short of withdrawing funding, the Government currently has few, if any, effective sanctions to address underperformance by an RDC. This is particularly so for industry-owned RDCs. The Commission seeks further input on what intermediate sanctions could be introduced.
- Ongoing concerns about the performance of Australian Wool Innovation (AWI) are damaging confidence in the RDC model. If AWI's next three-yearly independent performance review finds that the problems have not been satisfactorily addressed — and if a meaningful intermediate sanction cannot be found — then the case for the Government to withdraw its funding for AWI would be compelling.

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The Commission is recommending some overarching architectural and funding changes to the current Rural Research and Development Corporation (RDC) model, including the creation of a new publicly-funded RDC for procuring and managing non-industry specific rural R&D.

As illustrated by the many suggestions from inquiry participants, various changes could also be made to the detailed requirements of the RDC model, including to the particular ways in which those requirements have been given effect in specific industries. Viewed in isolation, many of these changes could have merit. However, introducing an array of additional detailed modifications would complicate the implementation of the proposed overarching architectural and funding reforms and an assessment of their impacts. Moreover, in a situation where public funding for the existing (industry-specific) RDCs was being gradually reduced, the Commission's view is that there would need to be good reasons to impose additional pressures and costs through the introduction of a large number of prescriptive new governance requirements.

The Commission therefore considers that supporting changes to the RDC model should focus primarily on:

- a common set of principles that attach to government funding for the RDCs, and the discharge by the Government of its responsibilities as a key stakeholder
- a small number of specific changes to support those principles, including to strengthen monitoring of outcomes and promote more effective enforcement of the requirements associated with government funding.

An important advantage of such an approach is that it would continue to provide considerable flexibility for the RDCs to tailor arrangements to suit their particular circumstances, while ensuring that there are effective mechanisms to identify poor performance and provide for follow-up action.

The following draft recommendation lists the principles that the Commission is proposing. In addition to drawing on the public-funding principles that should underlie the rural R&D framework as a whole (as outlined in draft recommendation 5.1), they also address some matters specific to the RDC model. These include the funding of marketing and industry representation services, and the possible consequences where an RDC fails to meet appropriate performance standards.



*As a condition of receiving government funding, Rural Research and Development Corporations (RDCs) should:*

- invest in a balanced project portfolio that includes longer-term, riskier and potentially higher-reward research, as well as short-term, low-risk, and adaptive research*
- have in place effective processes to ensure timely adoption of research results*
- use government funding solely for R&D and related extension purposes and not for any marketing, industry representation or agri-political activities*
- promote effective communication with industry stakeholders, researchers and the Australian Government*
- publish information on the outcomes of all completed research projects in a timely manner*
- implement board selection processes that result in boards with an appropriate balance of relevant skills and experience, rather than a balance of representative interests*
- pursue ongoing improvements in administrative efficiency*
- undertake rigorous and regular ex ante and ex post project evaluation*
- participate in regular and transparent independent performance reviews*
- remedy identified performance problems in an effective and timely manner.*

*For its part, the Australian Government should:*

- engage openly and constructively with RDCs and their industry stakeholders*
- discharge its administrative responsibilities in relation to the RDC program in a timely and efficient fashion*
- ensure that nominated representative bodies for each of the statutory RDCs continue to be suitably representative of the interests of the industries concerned, and not dependent on funding from the RDCs they are meant to oversee*
- monitor the RDCs' performance in a way that will enable transparent assessment of the outcomes of the program as a whole, and identification of specific performance problems*
- effectively communicate with RDCs in regard to opportunities to improve performance, and take prompt and appropriate action if performance problems are not satisfactorily addressed.*

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The remainder of this chapter outlines the specific changes that the Commission is proposing to support the principles listed in draft recommendation 8.1. The discussion is structured around four broad areas:

- changes to goals and functions
- promoting effective communication
- improving governance and administration
- strengthening performance monitoring and enforcement.

Some of the issues raised in these areas concern Australian Wool Innovation (AWI). As detailed in this chapter, there were widespread concerns among inquiry participants about ongoing governance and performance problems at AWI, and the potential for these to damage confidence in the RDC model. Hence, it is important for the integrity and ongoing health of all RDCs that the concerns about AWI be effectively addressed.

## **8.1 Changes to goals and functions**

### **Objectives and priority setting**

As noted in chapter 5, the objectives currently set for public funding of rural R&D in relevant legislation, associated agreements and policy guidelines do not focus on how that funding should add value. The Commission has therefore proposed that the Australian Government embody in all of its rural R&D programs the principle that public funding be directed at inducing socially-valuable R&D that would not otherwise occur. Consistent with this, the legislation and funding agreements governing the operation of the RDC model should be amended accordingly.

The Commission further considers that the level of government involvement in planning and priority-setting processes should be reduced. As outlined in chapter 6, the Commission envisages that with the creation of RRA, industry-specific RDCs would be left to focus predominantly on industry-focused research, with rural producers providing a greater share of total funding requirements. In these circumstances, the Commission sees limited value, and potentially some risk, of involving the Government in planning and priority-setting processes.

An example of how Ministerial involvement in planning can hinder the operations of RDCs was provided by the Grains RDC (GRDC, sub 129). It noted that the Minister currently approves annual operating plans on a financial-year timeframe, and this delays the trialing of new varieties until the following year because planting has to occur in April–May, but Ministerial approval does not occur until July.

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The Government will need to maintain an active role in monitoring outcomes and, where they are inconsistent with the intent of relevant legislation and agreements, enforce relevant requirements. Measures to improve monitoring and enforcement are examined in section 8.4 below. In this regard, additionality would be assessed against the first principle in draft recommendation 8.1 — that is, whether there has been a balanced project portfolio that includes longer-term, riskier and potentially higher-reward research, as well as short-term, low-risk, and adaptive research.

The Government should have a greater level of involvement in priority setting and planning for RRA and the Fisheries RDC (FRDC) because they will receive public funding to meet broader research requirements. However, care will be required to ensure that this involvement does not hinder RRA and FRDC from bringing their expertise to bear.

DRAFT RECOMMENDATION 8.2

***Consistent with the overarching public funding principles for the rural R&D framework (see draft recommendation 5.1), the legislation and statutory funding agreements for Rural Research and Development Corporations (RDCs) should indicate that the ultimate objective of the public funding they receive is to induce socially-worthwhile rural R&D that would not otherwise be undertaken.***

***With that guidance and the RDC-specific principles (see draft recommendation 8.1) in place, requirements for formal Ministerial involvement in priority setting and approving RDCs' plans should be removed, except for the Fisheries RDC and Rural Research Australia.***

## **Marketing and industry representation**

The *Primary Industries and Energy Research and Development Act 1989* (Cwlth) (PIERD Act) limits the role of statutory RDCs to undertaking R&D and associated extension. In contrast, IOCs are also responsible for marketing and, in the case of the Australian Egg Corporation (AEC) and Australian Pork Limited (APL), industry representation. These additional roles are funded by industry levies without any matching contribution from the Government. This is appropriate because producers should be able to capture sufficient benefits from marketing and industry representation to justify funding it themselves (that is, 'spillovers' beyond the relevant industry are unlikely to be so large that producers would significantly underinvest). Hence, one of the principles in draft recommendation 8.1 is that RDCs only use government funding for R&D and related extension.

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An additional element of monitoring and enforcement is required for the IOCs to ensure that they use government contributions solely for R&D. This could be avoided by compelling the IOCs to transfer their marketing and industry-representation roles to other bodies. However, there are administrative efficiencies in combining roles. For example, Meat and Livestock Australia (MLA, sub. 106) noted that its formation from separate marketing and R&D bodies had enabled it to reduce corporate-services employees from 37 to 18. AWI (sub. 110) said that the marketing role it took on through the purchase of the Woolmark Company in 2007 is expected to generate administrative efficiencies of around \$5 million. For very small RDCs like AEC, the savings from combining roles, as a proportion of total expenditure, may be very significant.

Furthermore, inquiry participants argued that there are significant synergies between R&D and marketing. For example, MLA (sub. 106) noted that feedback it received through its marketing role had been invaluable in factoring customer requirements into its research program (a similar observation was made by the Cattle Council of Australia, sub. 83). AgForce Queensland (sub. 74, p. 9) said that combining marketing and R&D provides RDCs ‘with direct feedback on consumer preferences and concerns that can be used to shape research priorities’. It also observed that RDCs with overseas marketing offices have been able to use this to facilitate contact with international researchers and draw on their R&D.

AWI (sub. 110) said that its joint responsibility for both R&D and marketing has encouraged greater investment in supply-chain R&D; made its research more responsive to the needs of wool processors, retailers and consumers; and reduced administrative costs. The Australian Wool Growers Association (sub. 73, p. 3) noted that, during 1998 to 2001, wool marketing and R&D had been split between the Woolmark Company and AWI respectively, and this had been a ‘serious mistake by all involved’.

Moreover, in defending its industry-representation role, APL (sub. 117) observed that most other RDCs also engage in strategic policy development directed at improving industry or government policies, despite it not being specifically recognised in their legislation or statutory funding agreements (SFAs). APL further observed that:

- having multiple functions, including industry representation, under one roof means greater efficiency, and hence a better return on investment for levy payers
- APL is constrained by a ‘no agri-political activity’ clause in its SFA, just like the other IOCs

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- the industry-representation role is more financially secure by being within the ‘secure funding frame’ of APL.

The Commission accepts that there can be synergies not only between marketing and R&D, but also with industry representation. In practice, most independent businesses combine these functions under one roof without problems, and indeed encourage close liaison between them.

It is therefore notable that the recently-negotiated SFA for AWI prohibits it from promoting itself as an industry-representative body, which the SFA links to agri-political activity. Specifically, the SFA states that AWI:

... must not engage in, or use the Funds for, Agri-Political Activity. To avoid doubt, the Company must only spend the Funds on Marketing and Research and Development Activities. This does not include activities promoting itself as an Industry representative body or referencing information from which stakeholders would assume the Company is an industry representative body. (s. 7.4)

The SFA further notes that:

‘Agri-Political Activity’ means engaging in or financing any form of external or internal political campaigning, but does not include an activity required or authorised under the *Corporations Act 2001* (Cwlth) or another law. (s. 1)

This requirement needs to be viewed in the context of widespread concerns about the governance of AWI (for example, Arche 2009; Australian Superfine Wool Growers Association, sub. 9; Burke 2009, 2010; Colin Agar, sub. 17; Dr John Keniry, sub. 80; Wool Producers Australia, sub. 48). In light of those concerns, it appears that the Government made a judgement that AWI had been unable to draw a clear line between industry representation and agri-political activity. AEC and APL do not appear to have had such difficulties. Hence, the Commission does not see the developments with respect to AWI as necessarily being indicative of the requirements that should apply elsewhere for marketing and industry representation. A sensible approach to industry representation, steering well clear of agri-political activity, may well have benefits for other RDCs.

There is, in fact, industry pressure to expand the range of functions that can be performed by the statutory RDCs. For example, Rural Industries RDC (RIRDC, sub. 92) noted that the effectiveness of its R&D was hampered by not being able to have a role in product promotion and market development like the IOCs. The Winemakers Federation of Australia (WFA, sub. 21) called for the establishment of a new industry-owned body that combined the R&D role currently undertaken by the statutory Grape and Wine RDC (GWRDC) with marketing and other functions housed in other bodies. WFA (sub. 21, p. 12) claimed that this would ‘align R&D with marketing, knowledge development and key policy development’ and create

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‘efficiencies of at least \$500 000 per annum’. Dr John Keniry (sub. 80, p. 2) noted that several statutory RDCs had undergone such a transformation and ‘there have generally been significant benefits for the industry as a result of closer integration of marketing and R&D programs, and a more holistic approach overall to industry development’.

The Department of Agriculture, Fisheries and Forestry (DAFF, sub. 156) observed that the shift towards replacing statutory RDCs with IOCs stemmed from industry perceptions of a need for collective marketing, and the synergies this has with R&D. If statutory RDCs were to continue to be confined to R&D, it is therefore conceivable that more of them would eventually opt to become industry-owned bodies. While it would be possible through legislative or funding changes to preclude such moves, or to even unbundle the R&D and other roles of the IOCs, the Commission does not see this as being desirable.

If there is effective monitoring and enforcement of requirements to ensure public funding for R&D is not misspent, there should be no reason why the wishes of producers to have other roles included in their RDC cannot be accommodated. What is therefore required is:

- a clear and appropriate definition of what constitutes R&D, so that it can be distinguished from marketing and industry representation
- an onus on RDCs to demonstrate that government contributions have only been used for purposes that comply with the definition of R&D
- a clear understanding of the definition of agri-political activity
- effective government monitoring of compliance, and enforcement action when breaches are detected.

The funding agreements that IOCs have negotiated with the Government include similar definitions of R&D and lists of examples that are eligible for matching government contributions. Moreover, the SFA for each IOC requires it to have accounting systems, processes and controls in place so that receipts and expenditure for R&D can be distinguished from funds used for other purposes. These have to be in accordance with ‘good accounting practice’, including all applicable Australian accounting standards. Such requirements appear to strike a reasonable balance between making RDCs accountable for their use of government contributions, and avoiding the inflexibility and financial costs associated with prescriptive rules.

The Commission was told of instances where government contributions had allegedly been used for marketing. Given that the definition of eligible R&D used in SFAs includes systematic experimentation or analysis to improve marketing, boundary-line issues will inevitably arise. However, the overall impression the

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Commission has gained in its consultations is that there is not widespread and significant diversion of government contributions to activities other than R&D.

In light of the above, the Commission considers that statutory RDCs should be allowed to take on a marketing role, where this is widely supported by levy payers and approved by the Minister. However, at this stage it would not be prudent to allow any further RDCs — statutory or IOC — to take on an industry-representation role. In particular, the effectiveness of recently-strengthened SFA provisions barring agri-political activity in dealing with the sort of issues that have arisen at AWI has yet to be assessed. Also, in the absence of any apparent pressure for more RDCs to take on industry-representative functions, making provision for this to occur could be an unnecessary distraction from the more important changes to the RDC model being proposed by the Commission. A better approach would be to leave the future review of RDC arrangements, recommended in chapter 9, to consider whether it would be appropriate at that juncture — having regard to the experience with AWI in the preceding period — to generally extend the allowable functions of RDCs to include industry representation (but not agri-political activity).

The Commission reiterates that effective monitoring and enforcement will be important to ensure that, if a statutory corporation takes on a marketing function, government contributions are used solely for R&D. Potential improvements in this regard are considered in section 8.4 below.

DRAFT RECOMMENDATION 8.3

***The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that the statutory Rural Research and Development Corporations (RDCs) can add marketing to their functions, where this is supported by the majority of levy payers and approved by the Minister for Agriculture, Fisheries and Forestry. The amendments should ensure that government contributions to any RDC that takes on marketing functions are only used to fund research and development, as defined in the Act.***

***The case for making industry representation a generally-allowable function for any RDC — statutory or industry-owned — should be considered as part of the proposed future review of the new RDC arrangements (see draft recommendation 9.5). In the interim, the two RDCs that already have an industry-representation role — the Australian Egg Corporation and Australian Pork Limited — should be allowed to maintain that function.***

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## **Adoption and dissemination of research outcomes**

There is no point in undertaking R&D if it is not adopted. Hence, one of the principles in draft recommendation 8.1 is that the RDCs have effective processes to ensure timely adoption of research results. This is consistent with the PIERD Act, which clearly states that the functions of statutory RDCs include facilitating the dissemination, adoption and commercialisation of R&D results (Department of Agriculture, Fisheries and Forestry, sub. 156). A similar clause is typically included in SFAs to define activities eligible for government contributions to the industry-owned RDCs (IOCs).

On a related issue, some participants criticised the lack of information that certain RDCs make available on research outcomes, and argued that those RDCs tend to shield some results under confidentiality clauses (chapter 5). There were, however, different views among stakeholders about whether this is actually the case. While the Commission is not in a position to verify the accuracy of the expressed concerns, there should be a general principle that the RDCs publish information on the outcomes of all completed research projects in a timely manner, given that the research is funded by taxpayers and industry levies. Hence, this is also included as a principle in draft recommendation 8.1.

Whether the RDCs are satisfying the recommended principles for adoption and communication of research should be assessed as part of the monitoring arrangements detailed below in section 8.4.

## **8.2 Promoting effective communication**

Without effective communication among stakeholders, it will be difficult for the RDCs to remain relevant and useful to those that fund and use their research outputs. Hence, draft recommendation 8.1 includes principles that the RDCs and Government should follow to facilitate effective communication.

### **Industry consultation**

Under the PIERD Act, the Minister is required to nominate at least one ‘representative organisation’ for each of the statutory RDCs. Those RDCs are then required to consult their representative organisation(s) about future plans and report on past activities, including through attendance at the representative organisation(s) annual conference or meeting of its executive.



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By acting on behalf of many levy payers in a given industry, representative organisations can be an efficient means for rural producers to convey their views to, and oversight the activities of, an RDC. This, however, depends on the nominated representative organisation(s) being genuinely representative of producers' views, sufficiently well resourced to convey those views to an RDC, and not being conflicted due to a reliance on funding from the RDC it is supposed to oversight.

Several participants raised concerns about existing consultation arrangements:

- The Murray Valley Citrus Board (sub.31) claimed that the nominated representative body for the citrus industry — Citrus Australia Limited — represents less than 30 per cent of the industry.
- The Australian Beef Association (sub. 154, p. 10) referred to the 'the turgid mess of boards and committees that directed and oversaw' MLA's operations.
- As detailed below, various shortcomings in AWI's industry consultation were mentioned in submissions and in an independent performance review.

Such industry-specific concerns, to the extent that they are valid, would best be addressed through specific initiatives, rather than broad changes to the RDC arrangements. However, the current situation in the grains industry is of more general relevance.

The nominated grains-industry representative body — Grains Council of Australia (GCA) — experienced a significant decline in its membership in recent years, and went into voluntary administration in June 2010. It has been reported that two separate proposals for a new grains industry body are being developed (Hemphill 2010).

The Grains RDC (GRDC) has dealt with the limitations of its nominated representative organisation by consulting more widely with parties in the industry. This is consistent with the PIERD Act, which provides for an RDC to consult beyond its nominated representative organisation, and to meet the reasonable travel expenses incurred by persons in such consultation. The Commission understands that GRDC also reimbursed a large proportion of GCA's travel and non-travel expenses related to consultation processes in recent years, which the PIERD Act allows for nominated representative organisations. While such reimbursement is legal, it could create a conflict of interest for representative bodies, if they receive a large proportion of their funds from the RDC that they are meant to oversight on behalf of rural producers.

In light of GRDC's experience, it could be argued that the PIERD Act should be amended so that RDCs are only required to consult with, and report to, a

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representative cross-section of the industry, rather than giving special status and financial assistance to a particular industry organisation. However, most RDCs would satisfy this amended requirement by continuing to deal with their existing representative organisation(s), assuming those organisations remained suitably representative of their relevant industry.

The PIERD Act also gives nominated representative organisations a right to participate in selection committees for board appointments at statutory RDCs. The question again arises of whether it would be sensible to require a general change to these arrangements simply to address an issue specific to a single RDC, and which in any event may prove to be transitory, if a sufficiently representative and appropriately funded new industry body emerges.

Any change in this area could attract considerable opposition. A number of inquiry participants, mainly but not only nominated representative organisations, argued strongly in favour of maintaining the status quo (for example, AgForce Queensland, sub. 74; Apple and Pear Australia Ltd, sub. 86; Cattle Council of Australia, sub. 83; NSW Farmers' Association, sub. 145; Sheepmeat Council of Australia, sub. 100).

The Commission has concluded that it would be inappropriate to amend the PIERD Act to remove the role of nominated representative organisations. Representative organisations can provide an efficient means for rural producers to convey their views to, and oversight the activities of, an RDC.

However, one of the broad principles that should attach to government contributions is that RDCs promote effective communication with industry stakeholders, as indicated in draft recommendation 8.1, consistent with requirements in the PIERD Act for statutory RDCs and in SFAs for IOCs. Draft recommendation 8.1 also includes the principle that the Government should ensure that nominated representative bodies continue to be suitably representative of the interests of the industries concerned, and not dependent on funding from the RDCs they are meant to oversight.

### *Concerns about AWI's industry consultation*

The performance of AWI in consulting with, and providing value for, industry stakeholders has been widely criticised as inadequate. An independent performance review (the Arche Review) found that AWI:

... has not had a consistent and transparent process for involving stakeholders in its strategy setting process. Industry stakeholders commented that consultation processes had been ad hoc, and focused on informing stakeholders of directions AWI is taking

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rather than involving them in the development of strategy and directions. (Arche Consulting 2009, p. 24)

Wool Producers Australia (sub. 48, p. 21) supported this finding and claimed that ‘the lack of formalised mechanisms for AWI to consult with growers has been a shortcoming of the company’. AgForce Queensland (sub. 74, p. 10) argued that AWI has ‘very little formal consultative mechanisms in place, meaning that industry R&D is not correctly targeted’. The Victorian Farmers’ Federation – Livestock Group (sub. 27) suggested that AWI would strongly benefit from having a prescribed industry consultation process like MLA, and identified Wool Producers Australia as the obvious choice for the nominated representative organisation.

Defending its performance, AWI (sub. 110, p. 28) claimed that it ‘adopts a highly consultative approach’. Nevertheless, it acknowledged that an internal review had reinforced the recommendations of the Arche Review, and led AWI to ‘adopt a more streamlined consultation process’, focusing on a Wool Growing Industry Consultation Committee and an Animal Welfare Forum. AWI also noted that in 2010 it would consult wool growers through R&D workshops in all wool growing areas and attend 50 regional events, such as field days.

One way to help ensure that AWI’s future consultation arrangements are appropriate would be to put highly-prescriptive requirements into its SFA. However, such an approach would be inflexible, limiting AWI’s ability to fine tune consultation processes in light of experience and changing industry circumstances. Thus, again the Commission considers that the emphasis should be on effective monitoring and prompt action to address underperformance where it occurs. Measures to improve monitoring and enforcement are examined in section 8.4 below. Changes to AWI’s governance arrangements could also be relevant, and these are considered below in section 8.3.

## **Government engagement with the RDCs**

Draft recommendation 8.1 includes the principle that the Government should engage openly and constructively with RDCs and their industry stakeholders. Without such engagement, the Government may find that the outcomes it is seeking are given insufficient weight or misinterpreted by the RDCs, and/or that levy payers misunderstand the Government’s motives for particular actions.

There was a general concern among inquiry participants that the Government has become less engaged in a dialogue with the RDCs in recent years (for example, Cotton Australia, sub. 68). This was attributed to a range of factors, including that the responsible Minister now has many more competing priorities than previously.

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Another commonly-cited factor was that the PIERD Act had been amended in 2007 so that there is no longer a ‘government director’ on statutory-RDC boards. Prior to 2007, the PIERD Act required the Minister to appoint a government director for each statutory RDC, with appointees to have experience in, and knowledge of, government policy processes and public administration.

The role of government directors was removed from the PIERD Act in response to a review of corporate governance in the public sector, known as the Uhrig Review (Uhrig 2003).<sup>1</sup> The Uhrig Review concluded that it was generally inappropriate for Commonwealth statutory authorities to have a governing board, where they have limited powers to act unilaterally (box 8.1). Instead, the review recommended that the executive management of statutory authorities report directly to the relevant Minister. A governing board was, however, considered appropriate for authorities not entirely the responsibility of the Commonwealth, or which undertake predominantly commercial operations.

The Minister for Agriculture, Fisheries and Forestry assessed the RDCs against the recommendations of the Uhrig Review, and concluded that they should continue to have governing boards. However, the Minister also decided that the appointment of government directors to those boards should be discontinued to ‘remove the potential for conflict of interest for serving public servants’ (McGauran 2007, p. 2).

Very few participants in this inquiry supported the move to dispense with government directors on RDC boards. One such participant was Apple and Pear Australia Ltd (APAL, sub. 86), which considered it more appropriate for the Government to pursue its accountability requirements for Horticulture Australia Limited (HAL) through the SFA rather than to participate on HAL’s board.

In contrast, the large majority of participants saw government directors as a useful way to enable ongoing engagement between RDCs and the Government, separate from the more formal accountability requirements (for example, Auscott Limited, sub. 5; Australian Superfine Woolgrowers Association, sub. 9; Corporate Agriculture Group, sub. 134; Sugar RDC, sub. 140). Indeed, there was a widespread view that removing government directors from statutory RDCs has led to a deterioration in the clarity of communication between the Government and statutory RDCs (for example, FRDC, sub. 102; GRDC, sub. 129; Dr John Keniry, sub. 80).

While some RDCs have attempted to address the loss of government directors by inviting a government representative to attend board meetings, it is evident that this is widely seen as being inferior to the pre-2007 arrangements. The involvement of

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<sup>1</sup> References to government directors in the PIERD Act were removed as part of the *Primary Industries and Energy Research and Development Amendment Act 2007* (Cwlth).

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government officials as observers is different from their previous role as directors. Also, the Commission understands that invitations to attend board meetings are not always taken up by government officials. Cotton Australia (sub. 68, p. 29) claimed that ‘attendance by DAFF representatives at RDC board meetings has been inconsistent and lacking in continuity of personnel and industry knowledge’.

**Box 8.1      The Uhrig Review of corporate governance**

In 2002, the Australian Government commissioned a review of corporate governance of Commonwealth statutory authorities and office holders. The resulting report — known as the Uhrig Review — concluded that most statutory authorities should not be governed by a board because it is not feasible for the Minister and/or Parliament to give a board full power to act, including to set policy. It was noted:

Where a board has limited power to act, its ability to provide governance is reduced and its existence adds another layer, potentially clouding accountabilities. (Uhrig 2003, p. 6)

The appropriate governance structure for most statutory authorities was deemed to be an ‘executive management template’ in which the executive management — headed by a chief executive or one or more commissioners — reports directly to the responsible Minister. This included statutory authorities administering regulation.

The alternative of having a governing board (the ‘board template’) was only considered to be appropriate if either:

- the statutory authority undertakes predominately commercial operations (because a board is more likely to be given the necessary powers to govern such an authority)
- the Commonwealth does not fully own the equity of the authority, or is not solely responsible for outcomes (in which case it is unlikely that all parties will agree to an Australian Government Minister solely governing the authority on their behalf). The main examples of this were said to be where there are multiple accountabilities, or where funding is predominantly from private sources (such as industry levies).

In 2004, the Australian Government endorsed the Uhrig Review’s recommendation that boards should only be used when they can be given full power to act. It also announced that it would implement the recommended governance templates. This was subsequently reflected in official guidelines on the governance arrangements for Commonwealth bodies.

*Sources:* DOFA (2005); Uhrig (2003).

The Commission gave some consideration to recommending a return to the pre-2007 requirement for statutory RDCs to have a government director, and extending this to the IOCs via their SFAs. Legal advice from the Australian Government Solicitor (AGS) indicated that both would be possible (box 8.2).

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### Box 8.2      **Legal issues associated with government directors**

The Commission obtained legal advice from the Australian Government Solicitor (AGS) on whether it would be possible to revert to the pre-2007 requirement for statutory RDCs to have a government director, and to extend this to the IOCs. The AGS advised that it would be possible for the Government to do this by amending the PIERD Act for statutory RDCs, and by negotiating a similar requirement in SFAs for the IOCs. The IOCs would then have to implement the requirement by changing their constitutions.

However, the AGS advised that a government director at an IOC could face conflicting legal obligations if they were also a Commonwealth public servant. Under the *Corporations Act 2001* (Cwlth), a person appointed to a company board by the Commonwealth would be obliged to act in the best interests of the company, not in accordance with the interests of, or follow the directions of, the Australian Government. Therefore, a situation could conceivably arise where a government director was unable to simultaneously comply with their obligations as a company director and as a Commonwealth public servant (the latter obligations being prescribed in the *Public Service Act 1999* (Cwlth)).

The Commission was advised that such inconsistency in legal obligations would not arise in the case of statutory RDCs because they are subject to the *Commonwealth Authorities and Companies Act 1997* (Cwlth) (CAC Act). Under s.27A of the CAC Act, an officer of a Commonwealth authority (which includes a director) does not contravene directors' duties provisions (or their common-law equivalents) in the course of the performance of their duties as a Government employee. While this removes the legal inconsistency for Commonwealth public servants who serve as directors at statutory RDCs, it does not eliminate the possibility that they will face a conflict of interest.

However, after due consideration, the Commission concluded that it would be inappropriate to return to a situation where the appointment of government directors was mandatory because:

- A mandatory arrangement would be inconsistent with the proposed general approach of providing RDCs with flexibility to determine how best to give effect to the principles in draft recommendation 8.1.
- The benefit from having a government director will inevitably be dependent on who is appointed to such a role, their compatibility with the rest of the board, and the Government's degree of engagement with that person.
- As detailed in box 8.2, government directors who are also Commonwealth public servants could potentially face conflict-of-interest issues, which in the case of the IOCs may also involve conflicting legal obligations.
- There are other options that the RDCs and Government could use to promote better communication between the parties, including, for example, a greater

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commitment to making the current observer arrangements at board meetings work effectively.

The Commission does, however, consider that an RDC should be given the option, rather than the obligation, to invite the Government to appoint a director to its board. The role of such a government-appointed director would be to complement existing board skills and improve dialogue with the Government. A useful criteria for selecting appointees would be that they had ‘experience in, and knowledge of, government policy processes and public administration’, as was prescribed for government directors in the pre-2007 PIERD Act (s.17(2)). Importantly, this would not automatically require the government-appointed director to be a current member of the Commonwealth public service.

It should be relatively straightforward to implement this option for statutory RDCs by amending the PIERD Act. The government-appointed director would be distinct from other directors — who, as now, would also be appointed by the Minister — in the sense that he or she would be selected by the Government outside of the usual nomination process (the processes are detailed below in section 8.3). For an IOC, implementation would involve negotiating a condition in its SFA (and subsequently implemented by the IOC changing its constitution). Again, the appointee would be selected by the Government outside of the usual nomination process.

However, the Commission emphasises that no such appointment should be made to either a statutory RDC or IOC without its agreement. In addition, to avoid potentially significant conflict-of-interest issues, a current member of the Commonwealth public service should not be a government-appointed director at an IOC.

DRAFT RECOMMENDATION 8.4

***Provision should be made in statutory funding agreements for the Australian Government to appoint a director to the board of an industry-owned Rural Research and Development Corporation (RDC) where that RDC requests such an appointment in order to complement existing board skills and improve dialogue with the Government. This director should not be a current Commonwealth public servant, but should have experience in, and knowledge of, government policy processes and public administration.***

***For the same purpose, the Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that the Government can, if requested to do so by a statutory RDC, select and appoint a single director to that RDC’s board outside of the usual nomination process. Such a director could be, though need not be, a current Commonwealth public servant.***

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## 8.3 Improving governance and administration

### Selection of board members

The PIERD Act specifies how board members of the statutory RDCs are selected. In summary, a selection committee has to invite nominations from all interested parties; consider candidates' expertise and experience against an RDC's requirements; and then make a recommendation to the Minister, who is responsible for appointing candidates (box 8.3). This process would tend to encourage the selection of boards on the basis of their skills.

IOCs are subject to the *Corporations Act 2001* (Cwlth), industry-specific legislation, their constitution, and their SFA with the Australian Government. The selection processes used to select board members under these instruments vary between the IOCs (box 8.4).

The primary concern expressed to the Commission about current board-selection processes relates to the arrangements used by AWI. That entity's most recent performance review found that the 'architecture of the constitution for the appointment of directors does not ensure that the AWI Board is skills based' (Arche Consulting 2009, p. x). Similar concerns were also expressed by several inquiry participants (for example, AgForce Queensland, sub. 74; Australian Superfine Woolgrowers Association, sub. 9; Colin Agar, sub. 17; Dr John Keniry, sub. 80; Wool Producers Australia, sub. 48). A contrary view was expressed by the Australian Wool Growers Association (sub. 73).

The Government has sought to address the concerns about AWI's board-selection processes in its recently-negotiated SFA, which includes new provisions on board governance (box 8.5). The Government has indicated its intention to also strengthen the governance requirements in SFAs with other IOCs. This has already occurred for HAL (sub. 101).

The new SFAs for AWI and HAL specifically refer to a document prepared by the ASX Corporate Governance Council (2007) — titled *Corporate Governance Principles and Recommendations* — as a guide to best-practice corporate governance, particularly with respect to the nomination committee. A revised version of that document will apply from 1 January 2011, including new requirements for board diversity, which may also be useful for the RDCs to follow (ASX Corporate Governance Council 2010).



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### **Box 8.3      Selection of board members for the statutory RDCs**

Under the PIERD Act, statutory RDCs are responsible for appointing an 'executive director' (some RDCs use the term 'managing director', but this is not in the Act). The legislation refers to other directors, apart from the chairperson, as 'nominated directors'. They have to be appointed by the Minister for Agriculture, Fisheries and Forestry from persons nominated by a selection committee. The chairperson is also appointed by the Minister, but is not nominated by a selection committee.

The legislation requires the Minister to appoint a presiding member for each RDC's selection committee, and direct that person to form a selection committee for the purpose of nominating directors. The presiding member has to write to an RDC's representative organisation(s) requesting that three to six persons be nominated for the selection committee. The nominees have to be approved and appointed by the Minister. For RDCs predominantly funded by the Commonwealth, the Minister can appoint selection-committee members that have not been nominated by a representative organisation.

Selection committees must invite nominations for a board vacancy through advertisements in the national press, and an invitation to the RDC's representative organisation(s).

There are also requirements to have regard to industry expertise and experience when forming a selection committee and nominating board members. Prior to nominating a board member, the selection committee must consult an RDC's chairperson about the appropriate balance of expertise and experience of the nominee to best ensure the effective performance of the RDC.

Candidates nominated to the Minister must have expertise in at least one of 14 areas specified in the PIERD Act. These include commodity production, processing and marketing; conservation and management of natural resources; science; technology and technology transfer; environmental and ecological matters; economics; administration of research and development; finance; business management; and public administration. In making a nomination, the selection committee must also take account of the need to ensure that the directors of an RDC collectively possess a balance of expertise in as many of these fields as appropriate for the relevant industry.

The PIERD Act bars an RDC's executive director from also being part of the executive of a nominated industry body. The Act bars other directors from outside employment that would, in the Minister's opinion, lead to a conflict of interest. Under s.66(b) of the PIERD Act, a director, other than an executive director, 'holds office, subject to this Act, for such term (not exceeding 3 years) as is specified in the instrument of appointment, but is eligible for re appointment in accordance with this Act'.

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**Box 8.4 Board selection processes for selected industry-owned RDCs****Australian Wool Innovation**

At the time of writing this report, members of the AWI board had been selected under a system in which candidates for directorships could be nominated either by the existing board (on advice from the Remuneration and Appointments Committee) or a signed nomination by at least 100 eligible shareholders (levy payers). Recent changes to AWI's statutory funding agreement are expected to alter how people are nominated for board vacancies (box 8.5). However, directors will continue to be elected at annual general meetings. The number of votes that wool growers can cast in a poll is based on the levies they have paid.

**Horticulture Australia Limited**

Candidates for board appointments are recommended by the Director Selection Committee. It comprises three to five persons from member industry organisations who are elected at annual general meetings. Candidates for directorships can also be nominated by a group of at least three member organisations. Votes are made by industry representative bodies, with the number of votes based on levies and voluntary contributions paid by the relevant industry.

HAL (sub. 101, p. 49) noted that it has negotiated a new statutory funding agreement with the Government in which it has 'committed to consider the establishment of a truly independent directors nomination committee. This requires a change to the [HAL] constitution and so will be raised for consideration by HAL members'.

**Meat and Livestock Australia**

A Board Selection Committee endorses candidates for election to the board based on skills, experience and industry knowledge. The selection committee comprises three members elected by producers (one each for the cattle, sheep and lot-feed industries), three members appointed by industry peak councils (one each for the Cattle Council, Sheepmeat Council, and Lot Feeders' Association), and three MLA Directors. Directors are elected at annual general meetings, with the number of votes cast by each member based on the levies they have paid.

**Australian Egg Corporation**

AEC's statutory funding agreement has a schedule of rules that have to be given effect in its constitution. This includes that AEC's board comprises up to four directors elected from direct nominations by members. A further three specialist directors (one of whom is the managing director) have to be ratified by a majority of members from nominations made by the board, following advice from a selection committee established by the board. The number of votes that each member can make is equal to the number of laying hens over the age of 18 weeks that it owns.

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**Box 8.5 Board selection under AWI's new statutory funding agreement**

On 1 July 2010, a new SFA between the Government and AWI came into force. Section 4.1 of the new SFA states that AWI 'should aim' to establish a skills-based board recommended by a nomination committee, subject to retirement and election requirements under AWI's constitution.

Section 1 of the SFA defines the characteristics of a skills-based board, and notes that the nomination committee would review required skills before each selection process:

'Skills Based Board' means a board which can demonstrate collective expertise against each of the following:

- (a) corporate governance;
- (b) wool growing;
- (c) wool processing;
- (d) product promotion and retail marketing;
- (e) domestic and international market development and international trade;
- (f) R&D, technology, technology transfer, commercialisation and adoption of R&D and innovation;
- (g) conservation and management of national resources;
- (h) administration of research and development; and
- (i) finance and business management.

Note: it is expected that the skills required to effectively manage the Company would be reviewed by the nomination committee before each selection process.

Section 1 also states that the nomination committee would be established by the AWI board, but with a majority of members who are not AWI directors. Furthermore, the nomination committee would recommend to the board necessary and desirable director competencies, and candidates with the necessary competencies to stand for election.

The SFA further states that AWI 'should aim' to set in place processes for evaluating the performance of the board and its committees. In addition, AWI must report to the Minister, or her/his delegate, at six-monthly meetings on steps taken to improve board corporate governance in accordance with the abovementioned provisions.

At the time of writing this report, AWI had yet to reveal how it saw its new SFA affecting specific board-selection arrangements. However, previous comments by AWI suggest that it views existing arrangements as already leading to the selection of a skills-based board:

Directors of the AWI Board are elected democratically by the company's shareholders in accordance with the AWI Constitution.

The current democratically elected AWI Board has extensive industry experience and strong grass roots connections. Its combined skills base includes marketing, research governance, accounting and business skills. This skills-based board is recognised and endorsed by the company's shareholders. (sub. 110, p. 32)

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Such comments appear to be inconsistent with the previously mentioned concerns by Arche Consulting (2009) and several inquiry participants. For example, the Australian Superfine Woolgrowers Association (sub. 9, p. 34) argued that ‘the AWI Board, with its present elective structure is a politically-based board, not a skills-based board’. Moreover, subsequent to the Arche review, three reports from external advisers on how to improve the organisation’s governance have not been publicly released.<sup>2</sup> This has added to a sense of a lack of transparency and the ongoing concerns that governance issues at AWI are not being adequately addressed.

Given the above, it will therefore be especially important for the Government to effectively monitor and enforce AWI’s new SFA. This issue is considered further below in section 8.4 as part of a discussion of monitoring and enforcement.

The Commission recognises that the changes in AWI’s SFA are unlikely to completely eliminate ongoing dissatisfaction in parts of the wool industry with the outcomes delivered by AWI. The heterogeneous nature of the industry, and its history of poor profitability, suggests that some degree of dissatisfaction is likely to be evident irrespective of the improvements made.

Nevertheless, consistent with the principle in draft recommendation 8.1 that RDCs should implement board selection processes that facilitate skills-based boards, the Commission supports the Government’s efforts to strengthen board-selection requirements in SFAs, provided they are based on sound principles of good corporate governance.

## **Administrative costs**

When introducing the PIERD Bill to Parliament in 1989, the Government indicated its expectation that RDCs would collaborate with each other to jointly fund projects, share results, and avoid duplication:

R&D corporations will be responsible for developing close liaison with each other. This will do much to ensure informed decision making and collaboration between corporations. It will assist in reducing unnecessary duplication and provide flexibility. It may also result in joint funding of projects and sharing of results ...

There may ... be cost savings to industry in that the [R&D] corporations will be free to share staff and premises if they consider this appropriate ... (Brown 1989, pp. 1404–6)

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<sup>2</sup> The Chairman of AWI acknowledged the existence of the three reports when appearing before the Senate Rural and Regional Affairs and Transport Legislation Committee in May 2010.

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However, the current division of funding responsibility among many industry-specific RDCs has the potential to cause significant duplication of administrative processes. It may also discourage cross-industry collaboration on R&D.

The administrative processes required to carry out their R&D functions — such as assessing bids from research providers, establishing contracts with those providers, and consulting producers — are broadly similar across the RDCs. *Prima facie*, this suggests that efficiency gains could be achieved by the RDCs pooling their administrative processes and expertise, or amalgamating into a smaller number of RDCs.

The smaller RDCs in particular could therefore be experiencing significant diseconomies of scale by maintaining their own administrative arrangements. RIRDC provides a potential model for bringing smaller industries under the remit of a single RDC so as to achieve economies of scale, and this arrangement appears to work relatively well.

However, there are clearly limits on how far such consolidation can be pursued. DAFF (sub. 156) observed that HAL covers over 40 levy-paying industries, and it can be difficult to get agreement across those industries to jointly fund projects that are of broad benefit to horticulture. APAL (sub. 86, p. v) noted that HAL ‘has reached its maximum portfolio size’ and ‘adding in more industries ... would diminish HAL’s ability to understand its core business’.

More fundamentally, there is a limit to which administrative arrangements can be made the same across industries. For example, industry-specific expertise is important in formulating strategic plans and annual operating plans, as well as for assessing proposals from research providers. The NSW Farmers’ Association (sub. 145, p. 26) noted that the existing industry-specific arrangements allow ‘the development of industry experts with a depth of knowledge in their field, rather than generalists’. In addition, it would be inappropriate to apply a one-size-fits-all approach to industry consultation. Industries that have a relatively small number of producers and are concentrated in a particular region, such as cotton, will require a different approach from industries, such as grains, that have a more diverse and widely dispersed base of levy payers. Indeed, the stability of the whole RDC model could be threatened if individual industries perceived that their particular interests had been subsumed within an amalgamated RDC. This was evident in many participants’ comments (box 8.6).

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**Box 8.6 Participants' views on amalgamating RDCs**

Meat and Livestock Australia (MLA, sub. 106) claimed that ongoing support for compulsory levies in the red-meat industry requires the maintenance of separate RDCs for producers (MLA), processors (Australian Meat Processor Corporation) and live exporters (LiveCorp). Similar sentiments were expressed by the Australian Live Exporters' Council (sub. 121), Australian Meat Industry Council (sub. 104), LiveCorp (sub. 57), South East Asian Livestock Services (sub. 132) and Wellard Rural Exports (sub. 107). Moreover, these participants noted that there is close collaboration between the three RDCs covering the red-meat industry, with MLA managing R&D on behalf of all segments of the industry. LiveCorp (sub. 57) claimed that this had enabled it to capture significant economies of scale while still retaining its separate identity.

The Australian Wool Growers Association (sub. 73, p. 4) noted that there had been suggestions that AWI and MLA merge to form a 'super RDC', but argued that this 'will not work, as wool growers will lose control of their levy and vote against a levy at Woolpoll'. Similarly, the Australian Superfine Woolgrowers Association (sub. 9, p. 36) said that it 'would be concerned if AWI was subsumed into a super RDC as the risk of loss of specialist knowledge would be increased and the specific R&D requirements [of the wool industry] may not be able to be met'.

Auscott Limited (sub. 5, p. 4) claimed that the amalgamation of RDCs would only achieve small cost savings and the cotton industry would be a significant loser. It observed that 'R&D works best when it is well focused on the short and long-term needs of an industry and its community'.

The Australian Egg Corporation (sub. 119, p. 22) argued that a separate RDC should be retained for eggs because the industry 'is unique when compared with other parts of the agricultural sector'. It noted that the egg industry has specific R&D needs in addressing the concerns of animal-welfare activists and clarifying the health benefits of eggs.

The Australian Dairy Industry Council (sub. 135) was concerned that any cost savings achieved by amalgamating RDCs would come at the cost of reduced transparency and accountability to levy payers.

The Sugar RDC (sub. 140, p. 46) claimed that a single-commodity RDC 'provides the optimal mechanism for accurate representation of industry R&D needs and delivery of outputs that cater to the adoption characteristics of the sugar industry'.

The RDCs have taken various initiatives, under the auspices of the Council of Rural Research and Development Corporations (CRRDC), to improve their administrative efficiency (box 8.7). These initiatives seemingly have the potential to address many of the current concerns about duplication or otherwise inefficient administrative arrangements, and therefore are to be commended.

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#### **Box 8.7 Initiatives to improve administrative efficiency**

The Council of Rural Research and Development Corporations (CRRDC, sub. 128) provided various examples of steps taken to improve administrative efficiency and more generally enhance the effectiveness of the RDCs' activities.

- In 2009, a consultant was hired to review the potential for harmonising management processes across RDCs, and found that some key processes and systems could be standardised. In response, the Canberra-based RDCs have formed working groups to explore the benefits from sharing offices, legal services, information and communication technology, and communications.
- Canberra-based RDCs are benchmarking information-technology services to identify areas for cost savings through standardisation. APL and FRDC already share a common project-management system. CRDC and RIRDC have approached the market for joint hosting services for their project-management system.
- A standard research agreement between the RDCs and their R&D suppliers is being drafted. This will be circulated to all RDCs for internal legal advice and approval.
- SRDC has sub-let part of its office space for Brisbane-based staff of HAL and APL. HAL provides office space for three Sydney-based APL staff. Negotiations are underway for GWRDC to house an Adelaide-based APL employee. Consideration is being given to further sharing of premises, taking into account existing lease terms.
- Business and communications managers meet at least twice yearly to identify opportunities for increased collaboration, and to share knowledge and expertise. Establishment of a forum for R&D program managers to share information on research techniques and project management is also being explored.
- The CRRDC is exploring ways in which government reporting requirements, such as for annual reports, can be streamlined and strengthened. It is also investigating how statutory funding agreements can be standardised.
- The CRRDC is examining the extent to which data collection and reporting can be streamlined, and it plans to consider developing a database that can collate cross-RDC data.

Given these initiatives, and that the quantitative information on administration costs is not particularly useful in shedding light on current levels of efficiency (chapter 4), the Commission does not consider it appropriate to pressure RDCs to amalgamate. Rather, any move to consolidation should emerge as an extension of the current administrative-improvement process. Nor does the Commission consider it necessary to recommend specific measures to reduce overheads or increase cross-RDC collaboration on R&D. That said, there should be a general expectation attached to government contributions that RDCs pursue ongoing improvements in

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administrative efficiency. Hence, this is one of the principles listed in draft recommendation 8.1.

An opportunity to enhance administrative efficiency appears to exist for those RDCs that are currently situated in very costly CBD locations in capital cities. This seems hard to justify, given the location of levy payers and other stakeholders. For industries that are concentrated in a particular region, good results appear to be achieved with the RDC located in that region. In this regard, the Cotton RDC (sub. 114, p. 12) noted that its location ‘in regional Australia provides advantages in connectedness to the research and end users as well as minimises associated location costs’. For industries that are genuinely national in nature, location near a major airport would seem to make sense.

Furthermore, the administrative efficiency of RDCs should be explicitly assessed as part of regular performance reviews. As detailed below in section 8.4, as part of this performance-assessment process, RDCs would be required to indicate what they are intending to do to address any identified performance problems. The Commission sees this approach as clearly preferable to prescribing particular administrative initiatives on an across-the-board basis.

Finally, the Commission emphasises that collaborative research effort by the RDCs will continue to provide opportunities to deliver better research outcomes for stakeholders and avoid duplication of effort. Thus, the establishment of RRA, and implementation of the Commission’s other recommendations, would not remove the onus on industry-specific RDCs to collaborate on cross-industry R&D where that would be more efficient than undertaking research individually.

## **Remuneration of board members and senior executives**

In March 2009, the then Minister for Agriculture, Fisheries and Forestry met with the CRRDC and raised the issue of growing community concern about the level of executive remuneration. The Minister followed this up in correspondence to each RDC, in which he indicated an expectation that the RDCs take account of community concerns when setting executive remuneration. He further noted that, as recipients of statutory levies and government funding, the RDCs have an obligation to take account of community and levy-payer expectations. The then Minister also raised the issue of RDC remuneration in a speech made in late 2009 (Burke 2009).

There are differences between RDCs in precisely how remuneration is set for senior people in the organisation. However, in broad terms it appears that:



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- the salary package for the chief executive is set by the board, after a remuneration committee comprising board members has considered advice (often including from external advisers) about packages paid by other organisations
  - at statutory RDCs, the remuneration of non-executive directors is set by the Remuneration Tribunal
  - at IOCs, there is an overall cap on the remuneration paid to non-executive directors as a group, with this amount specified in the IOC's constitution or through a resolution by members
  - each RDC has a remuneration policy that outlines the relevant processes, such as the composition and functions of its remuneration committee.

There was relatively little comment on remuneration matters by inquiry participants. However, this may be because recent criticisms by the previous Minister and others have already had some impact on remuneration levels, as distinct from signalling that the issue is of limited concern to industry stakeholders. For example, the Commission understands that the remuneration of some senior-executive positions at AWI and GRDC has declined recently. The lack of participant comments may also reflect a recognition that, to the extent that remuneration is an issue, it is because of shortcomings in board-governance arrangements.

Given recent developments, the Commission considers that more prescriptive requirements specifically for remuneration would not be warranted. Such requirements would probably impose sizeable compliance costs, including less flexibility to tailor arrangements to the circumstances of particular RDCs. As the Commission noted in its 2009 inquiry on executive remuneration, the structures used for remuneration are organisation and context specific, and a matter for boards to resolve rather than being amenable to prescriptive direction (PC 2009). Nevertheless, the Commission observed that informing stakeholders about the key dimensions of remuneration setting will often be warranted. This could include indicating how comparator groups for benchmarking executive remuneration and setting performance hurdles and metrics were selected, and how such benchmarks have been applied.

For the RDCs, monitoring and enforcement arrangements discussed below provide an avenue to identify and address cases where remuneration arrangements appear inappropriate. Where concerns are identified, the Government can request the RDC to justify its actions, and if not satisfied with the response, has the option of imposing funding sanctions. Furthermore, directors face the prospect of not being reappointed if they fail to take account of the concerns of stakeholders.

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## 8.4 Strengthening performance monitoring and enforcement

The Commission is proposing that, as far as possible, the RDCs be required to comply with a set of broad principles, rather than prescriptive requirements. However, to be effective, this needs to be backed up by effective performance monitoring and enforcement. In this regard, improvements are proposed for project evaluations, independent performance reviews, and regular monitoring of RDC outcomes by the Government. In addition, the Commission is seeking further input from participants on what intermediate sanctions could be introduced to deal with cases where an RDC breaches its obligations, as precursor to the ultimate sanction of a withdrawal of government funding.

### Project evaluations

Project evaluations can provide valuable information about the returns that RDCs are generating for levy payers and the wider community, and help the RDCs to learn from past experience, and thereby improve their future performance. Hence, draft recommendation 8.1 includes the principle that RDCs should undertake regular rigorous and regular project evaluations as a condition for receiving public funding.

Historically, there has been no specific requirement in either the PIERD Act or SFAs for RDCs to conduct *ex post* evaluations. Nevertheless, in recent years, the RDCs have participated in a program of evaluations coordinated by the CRRDC. Evaluations have so far been published for 2008 and 2009 (CRRDC 2008, 2010), the results of which were discussed in chapter 4. There was high participation by the RDCs in the 2008 and 2009 evaluations, and all RDCs are expected to participate in 2010 (CRRDC, sub. 128).

The Government has recently decided to specifically require the IOCs to undertake *ex post* evaluations, and is phasing this in as individual SFAs are renegotiated. For example, the most recent SFAs for AWI and HAL include clauses requiring a structured program of evaluations, and participation in any evaluation project established for all RDCs. The Commission supports this move, and considers that the statutory RDCs should have a similar requirement.

The Sugar RDC (SRDC, sub. 140) noted that it had willingly participated in the CRRDC evaluation process for its first three years, but in the longer term viewed annual evaluations as being unnecessary and absorbing staff and funding resources disproportionate to the benefit. Instead, SRDC favoured its five-year evaluations of R&D investments. However, the CRRDC (sub. 128) noted that it is examining

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mechanisms by which evaluation costs can be shared so as to ensure that all RDCs can cost effectively participate in its evaluation program. At least until such time as there is compelling evidence that undertaking structured cross-sector evaluations on an annual basis is prohibitively costly, or is delivering little new information, the current CRRDC-sponsored arrangements should be continued.

### *Methodologies and peer review*

The CRRDC (2009) has published guidelines on the methodologies to be used in RDC project evaluations. These were developed with the assistance of ACIL Tasman, and following consultation with various Australian Government agencies, including the Productivity Commission. In summary, the guidelines require the RDCs to transparently calculate benefit–cost ratios, net present values and internal rates of return for selected projects (box 8.8). Rather than providing detailed technical instructions on how net benefits should be calculated, the guidelines refer to the *Handbook of Cost Benefit Analysis* published by the Australian Government (2006).

The CRRDC secretariat prepares a summary of all of the project evaluations across the RDCs. The guidelines note that the secretariat’s report is to include a discussion of the counterfactual (likely outcomes if the R&D had not been undertaken), ‘public-benefit spillovers’, and additionality induced by government funding support.

The CRRDC (sub. 128) acknowledged that there is scope to improve project-evaluation methodologies over time, and has an ongoing program to explore such opportunities. For example, it is examining the extent to which indicators and metrics can be developed to quantify the social and environmental impacts of R&D. It also noted that inclusion of fixed costs will be considered as part of a review of the evaluation methodology in the second half of 2010. The Commission considers this to be an important enhancement to the current methodology, as would be an attempt to encapsulate into funding costs any implicit subsidies provided via government-funded research suppliers. Potential improvements could also be explored with respect to sample selection. At present, the methodology appears to exclude projects that fail at an early stage, thus creating an upward bias in reported returns.

The CRRDC (sub. 128) further noted that while a peer review process does not currently exist for the *ex post* evaluations, this will be considered as part of the review planned for the second half of 2010. Again, this would be a desirable

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## **Box 8.8 CRRDC guidelines for *ex post* evaluations**

### **Sample selection**

The guidelines require that unbiased, random samples of independent projects be analysed. To this end, those evaluating the RDCs' activities are required to randomly sample project 'clusters', where a cluster is defined as a set of projects focused on a particular research area which has reached a significant milestone in the last two to five years.

### **Categorisation of costs and benefits**

Examples of industry, environmental and social benefits are listed in the guidelines to guide researchers. Each evaluation must separate benefits into those that are private and those that are public. While the guidelines state that all benefits and costs should be identified, not all need to be quantified.

The assessments are only required to include costs that vary directly with the size of the project. Overheads and general administration costs are not to be taken into account. Nor is there a requirement to include implicit subsidies from publicly-funded R&D providers.

### **The counterfactual**

The guidelines specify that the calculation of net benefits take into account what would have occurred had the project not gone ahead (the counterfactual). The guidelines require that the counterfactual encapsulate any trends in the outcome of interest. For example, if yields have been increasing by 1.5 percent a year over a period of time, then this needs to be taken into account when assessing the benefits of a project.

### **Treatment of uncertainty**

The guidelines provide some strategies for dealing with the risks associated with innovations becoming obsolete, whether the technology will perform as predicted and whether end users will adopt the technology. The first of these concerns is addressed by requiring that all evaluations calculate benefit–cost ratios for 5, 10 and 15 year reference points. The risk of the technology not performing is to be accounted for by multiplying the net benefit by an estimated 'success factor' established on a case-by-base basis. Finally, the impacts of different adoption rates on estimated returns are to be tested through sensitivity analyses.

### **Attribution of benefits for collaborative projects**

The guidelines require that benefits arising from collaborative projects be apportioned on the basis of each contributor's funding share. However, the guidelines highlight that, in some cases, weightings other than funding shares may be appropriate for attributing benefits. For example, this may be the case when inputs like intellectual property, imported technologies and in-kind support are provided by a particular party.

*Source:* CRRDC (2009).

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enhancement. Indeed, the Commission considers that peer review should not only apply to the evaluations, but also to the science involved in the projects that the RDCs have sponsored. This would enable the veracity of concerns expressed by some participants (for example, Queensland Government, sub. 153) about the quality of RDC research, and the degree to which results and outcomes have been appropriately documented, to be tested.

Potential peer-review models that the CRRDC could consider are the review mechanisms used by the cooperative research centres (CRCs) and Australian Centre for International Agricultural Research (ACIAR). For example, the performance review that a CRC is required to commission after its first three years of operation must include a peer assessment of whether its research is of high quality (DIISR 2008).

Like the arrangements for CRCs, the Commission does not see a need for annual peer reviews of the science involved in RDC projects. This would be unduly onerous for a requirement designed more to ensure that appropriate research standards are being maintained. Instead, peer reviews of the science should be part of the independent performance reviews discussed in the next section, which are generally conducted every three years.

Finally, the Commission considers that aspects of the evaluation protocols employed by ACIAR might usefully be adopted for the RDC evaluation regime. In particular, ACIAR (sub. 118) noted that it has commissioned several reviews of its initial *ex post* evaluations to assess their credibility. The Commission considers that a similar arrangement would be desirable for the RDCs. That is, the RDCs could revisit past evaluations to assess whether assumptions about adoption rates and additional extension-related costs have proved to be reliable. If the assumptions have to be revised, there would then need to be an assessment of what this meant for estimated benefit–cost ratios. Experience gained from monitoring adoption rates achieved with past projects would help inform assumptions made in future evaluations.

DRAFT RECOMMENDATION 8.5

***The Primary Industries and Energy Research and Development Act 1989 (Cwlth), and the statutory funding agreements for industry-owned Rural Research and Development Corporations (RDCs) should be amended so that all RDCs are required to participate in a regular, transparent and comprehensive program-wide project evaluation process, such as that currently facilitated by the Council of Rural Research and Development Corporations (CRRDC).***

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*Through the CRRDC, the RDCs should continue to explore means to increase the robustness of this evaluation process, including through:*

- examining the scope to quantify, or put orders of magnitude on, environmental and social impacts*
- including an allowance for overhead costs and implicit subsidies from publicly-funded research providers in all evaluations*
- making provision for peer review of the evaluations*
- informing future evaluations with periodic reviews of past evaluations to assess whether assumptions about adoption rates and additional extension-related costs have proved to be reliable.*

## **Independent performance reviews**

Several participants suggested that the requirement for IOCs to commission regular independent performance reviews could usefully be extended to statutory RDCs (DAFF, sub. 156; GRDC, sub. 129; Tasmanian Department of Primary Industries, Parks, Water and Environment, sub. 148). The Commission considers that this has merit not only from a monitoring perspective, but also as a regular opportunity for statutory RDCs to get objective advice on what they are doing well and what areas they could improve upon. Hence, draft recommendation 8.1 includes the broad principle that all RDCs participate in regular and transparent independent performance reviews.

With a view to providing flexibility, the requirements for independent performance reviews should not be overly prescriptive. However, to ensure consistency across industries, and that important matters are not overlooked, the Commission considers that some prescription of review content is warranted. Specifically, there should be an independent assessment of the research balance in an RDC's project portfolio, the scientific merit of the research, and whether results have been made sufficiently accessible to all levy payers and other researchers.

On research balance, a potential criticism noted earlier in this report is that some RDCs' current R&D portfolios concentrate too heavily on projects that are short term, low risk and adaptive. As also noted in earlier discussion, there is a need for caution in responding to such criticism. Some short-term adaptive research can be additional (chapter 3) and may, in certain cases, provide a better payoff than longer-term, larger-scale and more-risky projects. Furthermore, if a concern to have more of the latter type of projects leads to the Government prescribing specific R&D tasks, there is a risk that this would involve potentially counterproductive 'winner picking'. At a more practical level, the scope to shift the balance of research

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sponsored by industry-specific RDCs away from the needs perceived as most important by levy payers is open to question.

That said, the Commission's view is that the current balance of research projects of some RDCs has been too heavily focused on small-scale and low-risk adaptive research. To the extent that this continues to be the case, then the amount of additional research induced by the government funding contribution is also likely to remain at very modest levels. A requirement that performance reviews for all RDCs include an independent examination of research balance could help to address this issue without the need for the Government to prescribe research outcomes.

DRAFT RECOMMENDATION 8.6

***The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that statutory Rural Research and Development Corporations (RDCs) are required to commission an independent performance review at least every three years, as is currently required for industry-owned RDCs.***

***Among other things, performance reviews for both the statutory and industry-owned RDCs should explicitly examine:***

- ***whether there has been investment in a balanced project portfolio that includes longer-term, riskier and potentially higher-reward research, as well as short-term, low-risk, and adaptive research***
- ***the scientific merit of the research involved***
- ***whether research outcomes have been made sufficiently accessible to all levy payers and other researchers.***

***Review reports should be provided to the Minister for Agriculture, Fisheries and Forestry — along with proposed actions to address any identified performance deficiencies — and then be made publicly available.***

## **Regular monitoring by the Government**

Regular monitoring of the RDCs by the Government will continue to be very important under the Commission's proposed funding reforms. Although government funding for the industry-specific RDCs would be lower than at present, that funding would still be significant. A considerable amount of taxpayers' funds would also be provided to the proposed new RRA. Furthermore, there would continue to be a need to ensure that government contributions are only used for R&D, rather than marketing and industry representation.

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To this end, the principles in draft recommendation 8.1 include an obligation on the Government to monitor RDC performance in a way that enables ready assessment of outcomes for the whole program, and identification of specific performance problems.

The Commission's strong impression is that past government monitoring of the RDCs has often been inadequate. For example:

- The degree of detailed engagement with the RDCs appears to have frequently been minimal, and often, to have been motivated by 'crisis' rather than by a need to keep abreast of how taxpayers' money is being spent.
- The removal of government directors, and the fact that there had not been a Parliamentary Secretary between the RDCs and Minister for several years, has not helped in this regard.
- DAFF was unable to furnish comprehensive data on funding and spending flows within the rural R&D framework, or anything more than very basic program-wide data on the RDCs' activities.

Thus, the Commission has concluded that some specific new requirements are necessary to ensure that the Government fulfils its critical oversight role for the RDC program in the future.

Specifically, the Commission proposes that DAFF should be required to produce annual monitoring reports for the RDCs as a group. These should draw on each RDC's annual audited accounts; contain detailed data on each RDC's funding flows, including a breakdown of industry and matching government contributions, as well as the division of expenditure between R&D and other functions; and provide a broad overview of research undertaken and associated outcomes. If an RDC had breached its obligations under relevant legislation and associated agreements during the monitoring period, this should also be documented in the monitoring report, along with details of the steps that have been, or will be, taken to address the problem. Furthermore, there should be information on the time taken by DAFF to implement any requested changes to R&D levies during the monitoring period (chapter 9).

While some of this information is already published in other forms, the Commission considers that there would be considerable value in bringing it together on a consistent basis in a single official publication. The Commission envisages that the proposed monitoring report would be considerably more data rich, and have a greater emphasis on monitoring compliance, than the program-wide outcome reports that the Government produced from 2001 to 2005 (DAFF 2005).



*The Australian Government's Department of Agriculture, Fisheries and Forestry should prepare a publicly available, consolidated, annual monitoring report on the activities of the Rural Research and Development Corporations (RDCs). These monitoring reports should draw, as appropriate, on the outcomes of the program-wide project evaluation process (see draft recommendation 8.5) and independent performance reviews (see draft recommendation 8.6), and contain:*

- *detailed data on each RDC's funding arrangements, including a breakdown of industry and matching government contributions, as well as the division of expenditure between R&D-related activity and any other functions*
- *a broad overview of R&D sponsored by the RDCs and associated outcomes*
- *details of any identified breaches of obligations under relevant legislation and associated funding agreements during the monitoring period; and the steps that have been, or will be, taken to address those breaches*
- *a summation of the Department's performance in implementing new R&D levies, and changes to existing levies (see draft recommendation 9.3).*

### **Decisive action and sanctions to address underperformance**

Effective monitoring needs to be complemented by credible enforcement when problems are identified. Again, there appears to be scope for improvement in this regard.

As noted previously, many inquiry participants were concerned about the performance of AWI, including with respect to industry consultation and the selection of board members. The Government has also indicated that it has had concerns (for example, Burke 2009, 2010), with the findings of AWI's 2009 performance review (Arche Consulting 2009) providing independent confirmation that aspects of the organisation's performance and operating arrangements have not been satisfactory.

Nevertheless, it appears that the Government has refrained from taking any specific enforcement action. What it has done is to recently negotiate a new SFA with AWI that:

- includes a broad indication of the type of board governance arrangements that AWI 'should aim' to have (as detailed previously in box 8.5)
- provides greater detail about the circumstances under which the Government could suspend or terminate payments to AWI

- requires AWI to commission a ‘follow-up’ review of its progress in addressing the concerns identified by Arche Consulting (2009), and advise the Minister how it will respond to the resulting recommendations (box 8.9)
- is more specific about the matters on which AWI is to report to the Government, such as the steps taken to improve board governance and how AWI intends to respond to the findings of the follow-up review.

#### **Box 8.9 AWI’s ‘follow-up’ performance review**

In AWI’s most recent three-year independent performance review, it was proposed that AWI’s progress in addressing the review’s recommendations be assessed in 12-months time in a further review (Arche Consulting 2009). The Government and AWI incorporated this proposal into their recently-renegotiated SFA.

Specifically, s.16.1 of the SFA requires a ‘follow-up’ performance review to be provided to the Minister by December 2010, followed by a response and implementation plan from AWI by the end of January 2011:

##### *16.1 Follow-up Performance Review*

Recommendation 11 of the 2009 Performance Review Report (the Report) was for a formal review to be conducted in 12 months time to assess the Company’s progress in addressing the Report’s recommendations (the Follow-up Performance Review): the Company [AWI] must by August 2010:

- agree the terms of reference of the Follow-up Performance Review with the Minister;
- engage a suitable organisation (the Reviewing Organisation) to undertake the Follow-up Performance Review;
- forward the Follow-up Performance Review Report to the Minister by December 2010; and
- provide the Minister with a detailed board response to the recommendations of the Follow-up Performance Review Report and a proposed implementation plan by the end of January 2011.

Under s.1 of the SFA, the follow-up review has to be undertaken by an organisation approved by both the Government and AWI:

‘Reviewing Organisation’ means an organisation agreed between the Department [of Agriculture, Fisheries and Forestry] and the Company to undertake the Follow-up Performance Review.

These changes may well increase the incentives for AWI to take effective steps to address performance concerns, and help the Minister and DAFF to identify the progress made in this regard. However, there remains little onus on the Government to go beyond requiring further procedural changes if it continues to have concerns. While this issue is currently most relevant to AWI, it could conceivably arise with other RDCs in the future.

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To signal the general importance of resolving an RDC's performance problems quickly and effectively, the principles in draft recommendation 8.1 refer to both:

- the need for the Government to effectively communicate with RDCs regarding opportunities to improve performance, and to take prompt and appropriate action if performance problems are not satisfactorily addressed
- an onus on RDCs to remedy identified performance problems in an effective and timely manner.

However, in considering the application of these principles, the AWI experience has illustrated a weakness in the current sanctions available to the Minister to deal with unremediated breaches of obligations by an RDC. Short of withdrawing funding, the Government has few, if any, effective sanctions to address underperformance. A withdrawal of funding would effectively penalise an industry for the failures of an RDC that rural producers are compelled to continue funding, at least in the short to medium term. It would also penalise research providers.

It is conceivable that more progress would have been made in addressing the problems at AWI if the Government had an intermediate sanction that could have been used as an alternative to the more extreme option of withdrawing funding. The Commission gave consideration to various options, including possibly making changes which would give the Minister the power to 'spill' an RDC board and initiate a fresh board-selection process. However, a board spill might be viewed as no less draconian than a withdrawal of funding, would be much more administratively cumbersome, and would raise concerns about the potential for Ministerial involvement in the day-to-day operations of an RDC, possibly to the detriment of levy payers. Consideration would also have to be given to how an RDC could function in the period between a board spill and the appointment of a new board. There would likewise be problems with alternative financial sanctions — such as the Government refusing to collect or pass on levies until performance problems are addressed — because they would be similar to a withdrawal of matching contributions, even if only on a temporary basis.

The Commission is therefore seeking further input from participants on whether there are any intermediate sanctions that could be more readily invoked by the Minister, and which might be more likely to induce remedial action by an underperforming RDC, than the current approach of simply relying on a greater degree of admonition or prescription about how that RDC should behave in the future.

Notably, the current approach appears not to have been very effective in dealing with what are widely perceived to be significant and ongoing performance issues

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within AWI. As well as concerns about the direct impacts on the returns to levy payers and the community from AWI's R&D investments, several stakeholders pointed to the potential for instability and unresolved performance issues within AWI to degrade confidence in the RDC model as a whole. In the Commission's view, this situation should not be allowed to continue. AWI's recently-renewed SFA and 2009 independent performance review detail a range of specific issues that need to be addressed by AWI. If the next three-yearly independent performance review of AWI (due by 2012) indicates that appropriate remedial action has not been taken — and if a meaningful intermediate sanction cannot be found — then the case for the Government to withdraw its funding for AWI would become compelling.

#### INFORMATION REQUEST

*The Commission seeks further input on what 'intermediate' sanctions could be used to address ongoing underperformance by a Rural Research and Development Corporation prior to any withdrawal of public funding for the entity concerned.*

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## 9 Levy and review arrangements

### Key points

- While the current mix of statutory levies and voluntary contributions, and the variety of different bases used to calculate statutory levies, add to the complexity of the levy system, there currently appears to be no need to change these arrangements.
- The statutory maximum levy rates serve little purpose, and removing many of them would make it easier for industries to increase their investment in R&D.
- Preparing proposals for new levies or changed levy rates is unnecessarily time consuming and costly for industries. The Levy Principles and Guidelines document should therefore be revised to make the burden of complying with the Levy Principles commensurate with the nature of the proposed levy changes.
- The Department of Agriculture, Fisheries and Forestry (DAFF) should, in future, seek to implement new or changed levies within six months of receipt of a properly prepared and documented proposal.
- While the collection costs for most levies are very low, the Levies Revenue Service in DAFF should continue its efforts to improve its efficiency, monitor its performance and promptly communicate to stakeholders the results of such monitoring and details of any changes made to procedures or cost allocation protocols.
- Although some processors pay statutory R&D levies, such levies should not be extended to other industries.
- Matching government payments for non-levy R&D contributions from individual entities in the horticulture and red meat industries raise some concerns. However, the scope for problematic public support of this nature would be significantly reduced by the proposed reduction in government funding for industry-specific RDCs.
- While levy payers from different regions can have different needs, any attempt to precisely calibrate RDC research portfolios with the regional distribution of levy payments, or to select research suppliers on a regional basis, could reduce the overall returns for the rural sector and the wider community.
- There should be an independent public review of the effects of the proposed new RDC arrangements, commencing at the end of the ten year phase-in period.

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Rural Research and Development Corporations (RDCs) receive a sizeable share of their funding in the form of levies on producers and, in some cases, processors. There is considerable variation and complexity in levy arrangements, particularly in relation to levy bases and procedures for changing levy rates. This chapter examines the efficacy of levy arrangements, with a particular emphasis on ensuring that the arrangements are supportive of the funding changes that the Commission is proposing for industry-specific RDCs. It also sets out the Commission's proposal for a review of the new arrangements governing RDC funding and operations.

## **9.1 How are levies structured and collected?**

### **A mix of statutory levies and voluntary contributions**

Most of the existing RDCs receive all of their industry funding via statutory levies. While the levy rate is ultimately set by government, it must first be agreed to by industries through an industry vote. Levy payers can choose any rate up to the maximum rate specified in legislation. However, because levy payers can vote to set the levy rate to zero (effectively removing the levy), current statutory levies could be said to have some 'voluntary characteristics'.

While these voluntary characteristics often make little practical difference to levy payers, they can become important if a sizeable share of levy payers consider that they are not receiving sufficient benefits from their levy payments (see chapter 6 and section 9.6). Levy payers' ability to vote to set the levy rate to zero also sets levies apart as a mechanism for collective industry investment, rather than a tax (which they are sometimes incorrectly perceived to be).

As well as receiving statutory levies, some RDCs — such as Horticulture Australia Limited (HAL) and Meat and Livestock Australia (MLA) — also collect voluntary contributions. The Fisheries RDC (FRDC) and the Rural Industries RDC (RIRDC), which are both primarily funded by the Australian Government, receive the bulk of their industry funding through voluntary mechanisms (with some income from statutory levies on a small number of industries). RIRDC 'matches' voluntary levies and contributions from industries such as horses, fodder crops and tea-tree oil out of its government appropriation. In addition to voluntary contributions from specific fishing industries and a levy on prawns, FRDC receives income via Commonwealth, State and Territory fisheries management agencies.

Not surprisingly, there was a diversity of views on the merits of statutory versus voluntary levies. A number of inquiry participants argued that a voluntary contribution system can be beneficial, particularly for small, emerging industries

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(for instance, Stahmann Farms Enterprises, sub. 23; Australian Nut Industry Council, sub. 49). The main argument put in this context was that voluntary levies can be a useful step towards a statutory levy. Conversely, inquiry participants in industries already subject to statutory levies strongly supported their compulsory nature, considering that ‘to use a voluntary system at national level will inevitably invite more “free loaders”’ (South Australian Grain Industry Trust, sub. 11, p. 3).

The Commission examined arguments in favour of both compulsory levies and voluntary contributions and concluded that, in practice, the current mix of statutory levies and voluntary contributions is broadly appropriate (box 9.1). It does, however, have reservations about the voluntary contribution arrangements in the horticulture and red meat industries (see section 9.5).

**Box 9.1      Is the current mix of statutory levies and voluntary contributions appropriate?**

In comparison to voluntary contributions, compulsory levies have several important advantages. As explained in chapter 3, if members of an industry can ‘free ride’ on other industry participants’ investments in R&D, marketing or other non-rival goods, there is likely to be under-investment in those goods from society’s point of view. Compulsory levies are more likely than voluntary levies to ameliorate the disincentives for investment, because under the latter there is still scope for individual producers to opt out. Compulsory levies can also provide greater certainty in forward levy collections and entail lower transaction costs (because convincing individual parties to make voluntary contributions can be time-consuming and thus expensive).

Equally, the time and effort required to persuade individual producers or other parties to contribute on a voluntary basis can help to make RDCs more responsive to their stakeholders’ needs. Moreover, establishing a statutory levy may be impractical for very small or emerging industries.

The Commission further notes that while statutory levies and voluntary contributions are often viewed as totally different systems, the difference between the two is, in practice, a matter of degree. This is because Australia’s statutory levy system has ‘voluntary characteristics’, in that levy payers can collectively vote to set the levy rate at zero (see text).

In any event, there has been no suggestion that the current voluntary arrangements are having a negative impact on the effectiveness of entities such as FRDC and RIRDC. Indeed, as noted in the text, many see them as having significant benefits in helping to catalyse R&D in emerging rural industries and as a stepping stone to statutory levies. Hence, the Commission sees no pressing need to alter the balance between statutory and voluntary levies within the RDC system.

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## Statutory levies are set on a variety of bases

The statutory basis for levies is provided by the *Primary Industry (Excise) Levies Act 1999* (Cwlth) (the Levies Act). Actual levy rates are specified in the Primary Industry (Excise) Levies Regulations 1999 (the Levies Regulations), up to the maximum rates specified in the Levies Act.

Levies are set on a different basis in each industry. The bases can be classified into six main categories:

- levies on unit output, for instance per pig slaughtered
- levies on output weight, such as kilograms of fruit, tonnes of sugar or bales of cotton
- levies on other characteristics of output, such as the surface area of turf or the level of milk fat and protein in milk
- levies on the value of output, such as a percentage of the sale price of sheep and lambs
- levies on the quantity of inputs, for instance mushroom spawn or chicks (as an input to the egg industry)
- levies on the value of inputs, notably on the value of pots (as an input to the nursery industry).

While the number of different levy bases makes the levy system more complex, these levy bases are well understood by industry and the alternatives do not have clear advantages (box 9.2). The Commission therefore considers that there is no compelling case for seeking greater uniformity in bases, and more particularly for a generalised move to value-based levies, at this time.

## Levies are collected by the Levies Revenue Service

With one exception, the levies imposed by the Levies Act are collected by the Levies Revenue Service (LRS) which is part of the Department of Agriculture, Fisheries and Forestry (DAFF).<sup>1</sup> In addition to collecting and disbursing RDC levy income, LRS administers the government co-contribution to R&D and collects and disburses other agricultural levies (including those for the Australian Animal Health Council, the National Residue Survey and Plant Health Australia).

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<sup>1</sup> Levies on imported forest products — the only import currently subject to an R&D levy — are collected by the Australian Customs and Border Protection Service.



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**Box 9.2      Should levies continue to be set on different bases?**

Given the complexity of the current levy system, a move to value-based levies would at face value have some advantages. In particular, aligning industry contributions with government contributions to R&D, which are made on the basis of the gross value of production of each industry (chapter 2), would arguably simplify the levy system.

In some cases, moving to value-based levies could also make it easier for industries to maintain the real value of levy contributions. Where levies are based on units or characteristics of outputs or inputs, industries must seek explicit support from levy payers for higher nominal levies, with all the time and expense that such votes entail. In contrast, provided output prices trend up over time, per unit collections from value-based levies will automatically trend up as well.

Similarly, for goods that are primarily traded in the domestic market, value-based levies can reduce short-term volatility in levy collections, relative to levies based on units or characteristics of output. (If goods are only traded in the domestic market, prices and output levels will tend to move in opposite directions in the short term, meaning that changes in the value of output are likely to be smaller than changes in the quantity of output.) Volatility in levy collections can be difficult for levy payers to manage (table 3.1) and can, in turn, make it harder for RDCs to budget and plan their activities.

However, calculating levies on the basis of the value of industry production would not have advantages for all industries. Many of the levy-paying industries export a significant share of their production. For goods that are primarily traded on international markets, levies on the value of production could increase, rather than decrease, volatility in levy revenue (if fluctuations in world prices were proportionately greater than changes in local production). Similarly, prices can trend down as well as up, especially where a product is internationally traded. Value-based levies therefore provide no guarantee that the real value of levy income will be maintained over time.

Moreover, there are advantages to the current heterogeneous system, including that each levy is based on a commonly used and well-understood measure in that industry. Thus, it is far from clear that there would be much support for a generalised move to a value-based levy regime. Also, other levies are calculated on the existing, non-value bases, including the levies which fund the Australian Animal Health Council, the National Residue Survey and Plant Health Australia. Changing the bases of the R&D and marketing levies would therefore necessitate changing the bases of the other levies or accepting added complexity in the mix of levy bases.

LRS operates on a cost-recovery, not-for-profit basis, and ‘apportions costs to each levied industry based on the work undertaken by LRS for their levy in the previous financial year’ (DAFF, sub. 156, p. 26). Across all levies, average collection costs in 2008-09 were less than one per cent (DAFF 2010a). Costs were generally higher in smaller industries, ranging from 0.1 per cent of levy revenue (wheat and cattle transaction levies) to an outlier of 38 per cent of levy revenue (queen bees). Some industries have reduced collection costs by exempting very small producers from

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levy payments. Other industries have chosen not to do so, resulting in a higher proportion of levy funds being spent on levy collection.

There are good reasons why levies should continue to be collected by LRS (box 9.3). However, the Commission considers that LRS could take further steps to ensure that its activities are transparent and its performance is, and remains, efficient (see section 9.3).

**Box 9.3      Should levy collection remain with LRS?**

In other countries, levy collection is not undertaken by government. Rather, levy-funded industry organisations collect R&D and marketing levies directly from growers and other levy payers. However, the option of RDCs collecting statutory levies for themselves is precluded by section 81 of the Australian Constitution, which requires all revenue or moneys received by the Commonwealth to form one consolidated revenue fund. As levies are considered to be government revenue, this provision effectively means that all statutory levies must be collected by the Government. Indeed, LRS is careful to note that it ‘pays all levies and charges into the Consolidated Revenue Fund, without deduction, before disbursing them’ (DAFF 2009b).

The requirement for a government agency to collect and disburse RDC levies does not imply that LRS, or indeed DAFF, must undertake those functions. But while it is possible, in theory, that another government agency could undertake the levy collection function more efficiently than LRS, there would be obvious downsides to this approach, including loss of LRS expertise. It is also unlikely that levy collection costs could be substantially reduced by such a move, given their current low level. The Commission therefore considers that levy collection should continue to be undertaken by LRS.

## **9.2      How are levies created or changed?**

### **Levy change step 1: demonstrate compliance with the Levy Principles**

DAFF requires proposals for new statutory levies or changes to existing levies to satisfy the Levy Principles. The principles require industry bodies to demonstrate that the proposed levy addresses a market failure and is equitable, efficient and supported by the industry. The principles are expressed in quite general terms, so DAFF also publishes more detailed guidelines to explain what is required to fulfil them (DAFF 2009a).

In order to demonstrate industry support for a proposed new levy or a changed levy rate, industry representative bodies generally engage the Australian Electoral

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Commission or a State electoral commission to conduct a poll of all known producers. DAFF strongly encourages the use of electoral commissions to conduct such polls. The wool and dairy industries are subject to a special requirement that voting procedures be approved by the Minister and specified in regulations.

As the Tasmanian Department of Primary Industries, Parks, Water and Environment noted, ‘changing a levy can be very expensive including significant advertising and mail out campaigns articulating the various arguments’ (sub. 148, p. 21). Engaging an electoral commission or other provider to conduct the ballot can also be costly — the most recent review of the wool levy (WoolPoll 2009) cost \$680 000 (Australian Wool Innovation, sub. 110), while direct costs associated with the vote to retain a temporary increase in the beef marketing levy exceeded \$340 000 (MLA, sub. 106).

As well as being expensive, preparing a levy proposal is also very time consuming. On average, it takes industries around twelve months to put together a proposal for a new or changed levy that complies with the Levy Principles (DAFF, pers. comm.)

## **Levy change step 2: enact legislation or regulations**

Once an industry has conducted a ballot and submitted a formal proposal, DAFF allows six weeks for objections to the proposed levy to be raised. If there are no objections and DAFF is satisfied that the Levy Principles have been met, preliminary Ministerial approval is sought. The effect of proposed new levies on levy payers’ business interests must be formally considered through preparation of a Regulation Impact Statement.

Increasing a levy above its statutory maximum rate requires parliamentary approval. New levies can also be given effect through an Act of Parliament (but this is not required in all cases). The process of obtaining a place on the legislative program, having a bill drafted and then introduced, debated in and passed by Parliament takes at least a year, and commonly much longer (DAFF, pers. comm.).

Changes to existing levy rates that are within the current statutory maximums can be put in place more quickly, but this is by no means guaranteed. It requires amendment of the Levies Regulations, and such amendments must be approved by the Minister and then by the Governor-General in Executive Council. While this can sometimes be accomplished in as little as a few months, it can often take more than a year (DAFF, pers. comm.). For example, the need for a passionfruit marketing levy was identified in late 2007 (Australian Passionfruit Industry Association nd). Although its creation was supported by industry and did not require legislative change, the levy was not put in place until May 2010, with levy collection starting in July 2010.

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## Regular review of levy rates

Possibly due to the time and effort required to change levy rates, such changes are relatively uncommon. Some rates have not changed since the current levy system was introduced in 1989. Indeed, only two industries are currently required to conduct regular reviews and polls on levy rates — the wool industry must demonstrate its continued support for the wool levy every three years, while the dairy industry must review the dairy services levy every five years. (This may be related to the fact that the dairy and wool industries have a single levy that can be used for either R&D or marketing. Most other industries do not have the flexibility to change the allocation of levy funds between R&D and marketing — see section 9.3.)

In other industries, periodic review is encouraged by levy principle 11, which requires every new levy proposal to contain a plan for reviewing the levy by a certain date. However, in practice, DAFF does not appear to monitor whether industries adhere to their stated levy review plans, and the effectiveness and adequacy of most levies has not been formally reviewed for many years.

The application of the *Legislative Instruments Act 2003* (Cwlth) will require levies to have been reviewed by 2016, and every ten years thereafter (box 9.4). For many industries, this will increase the frequency with which levy rates are formally reviewed and voted upon.

### Box 9.4      **Automatic repeal (sunsetting) of levy regulations**

The *Legislative Instruments Act 2003* provides for the automatic repeal (sunsetting) of legislative instruments, such as regulations and determinations, after 10 years. This requirement will apply to R&D, marketing and promotion levies, because levy rates for each industry are specified in the Primary Industries (Excise) Levies Regulations 1999 (the Levies Regulations). The Levies Regulations will sunset in 2016.

To enable levies to continue beyond that date, new regulations will be required. It is therefore expected that in 2015, all of the industries concerned will need to review and vote on new levy rates, as a precursor to the creation of new regulations to replace the current Levies Regulations.

Sources: DPMC (2004); DAFF (pers. comm.).

The Commission considers periodic review of levy rates to be good practice. It ‘enables representative organisations to proactively address the currency of the levy rate’ (Cotton Australia, sub. 68, p. 31), and more fundamentally, it ensures that levy payers continue to support the levies and have the opportunity to maintain their investment in R&D in real terms, or even increase it over time. At the same time,

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the threat of a vote for a lower levy provides a discipline on RDCs to effectively meet the needs of their industry stakeholders (though, as discussed in chapter 6, this threat also reduces the extent to which the RDCs can shift the balance of their portfolios away from research of direct benefit to those stakeholders).

Had the review requirements of the Legislative Instruments Act not been due to take effect, the Commission would have recommended a similar process of regular review. In fact, the Commission gave consideration to recommending five-yearly reviews and ballots, an approach suggested by John Keniry (sub. 80).

However, more frequent reviews and ballots would add considerably to RDCs' administrative costs. Also, there is a case for keeping the review requirements for levy rates in line with the review requirements for all other legislative instruments. Moreover, a ten-yearly formal review requirement does not preclude an individual industry from reviewing its levy rate on a more regular basis.

The Commission further notes that sunset provisions of the Legislative Instruments Act will themselves be reviewed in 2017, and that consideration has already been given to reducing the sunset period from ten years to five years (Blunn, Govey and McMillan 2009). The Commission is therefore not proposing to recommend that different review provisions be implemented for rural industry levies.

The review requirements for the wool levy and the dairy services levy are special cases, with the three-yearly review requirement applying to the wool levy attracting some criticism. For instance, the Australian Superfine Wool Growers' Association suggested that 'the 3 year frequency is too short and is disruptive ... the uncertainty that this creates and the loss of momentum is a serious impediment to achieving long term benefits for the wool industry' (sub. 9, pp. 7 and 15).

However, the actual extent of such disruption is unclear, as levy rate votes have recently coincided with board elections, themselves a source of disruption. Given that a new statutory funding agreement for AWI has recently been negotiated, the Commission does not see it as appropriate to propose changes to the particulars of the WoolPoll arrangements. That said, if there were any future initiative to unbundle the levy vote process from board elections, somewhat less frequent polls could be considered. Similarly, the Commission is not proposing any changes to the specific five-yearly voting requirements for the dairy services levy. As noted above, the choice between a ten-yearly and five-yearly review requirement is finely balanced. Moreover, the Commission notes that there will be an opportunity to revisit the review requirements for the wool, dairy and other industry levies as part

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of the broader independent review of the proposed new RDC arrangements (section 9.7).

### **9.3 Improving the levy system**

As outlined above, the Commission is not proposing to recommend changes to the core elements of the current levy system. It nevertheless considers that a small number of more specific changes could materially improve the efficiency of the current arrangements.

#### **Simplification of maximum levy rates**

The Levies Act specifies two different maximum levy rates for each product. There is a ‘generic’ maximum that applies to all animal products or all plant products and a ‘product-specific’ maximum that applies to each individual product (box 9.5).

Maximum rates are included in the Levies Act because Parliament requires any legislation that delegates legislative power to include limits on that delegation (Senate 2009). So, while the Levies Act allows levy rates to be set by regulation, it only grants this power within limits specified by Parliament. This need to limit delegated legislative power provides justification for the generic levy maximums, which are generally much greater than the current levy rates (see box 9.5).

However, the rationale for, and usefulness of, the product-specific maximums remains unclear. Many of these maximums were set in 1999 (when the Levies Act came into force), and there is no requirement that they be reviewed or adjusted to keep pace with cost increases. As such, for levies based on units of output or inputs, the real value of the maximum rates has eroded considerably over time. Some of the product-specific maximums were even carried over from Acts that were replaced by the Levies Act, meaning that several have remained unchanged for more than 20 years.

To the extent that maximum levy rates condition industry perceptions of how much they should be spending on R&D, the erosion of their real value could be seen as undesirable. Notably, few industries have moved to increase levies above the product-specific maximum, with only one such application in the past five years.

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**Box 9.5      Examples of current levies and ‘generic’ and ‘product-specific’ maximum levy rates****Pig slaughter**

The pig slaughter levy is currently \$1 per pig for R&D and \$1.35 for marketing, making a total of \$2.35 per pig. The product-specific maximum levy rates for pigs are \$1 per pig for R&D, \$2.50 for marketing and 50 cents for the Australian Animal Health Council, making a total of \$4 per pig (Schedule 22 to the *Primary Industries (Excise) Levies Act 1999* — the Levies Act). Thus, if the pig industry sought to increase the pig R&D levy, the Levies Act would need to be amended, which can take a considerable time.

Pig slaughter levies are also limited by Schedule 27 to the Levies Act, which contains ‘generic’ maximum levy rates for all animal products. The generic maximums provide that the total rate(s) of levies must not exceed the greater of:

- (a) \$5 per unit of the animal product
- (b) 35 cents per kilogram of the animal product
- (c) 7 per cent of the value of the animal product.

This provision will, in practice, have little constraining impact on the rates of R&D or other pig levies. For example, for a pig weighing 75 kilograms, the effective maximum levy rate given by Schedule 27 would be \$26.25.

**Sugar cane**

The product-specific maximum levy rate for sugar cane is 15 cents per tonne (Schedule 24 to the Levies Act), only slightly higher than the current sugar cane R&D levy of 14 cents per tonne. Thus, the sugar industry also has little scope to increase the R&D levies paid under the RDC arrangements (as distinct from the separate voluntary levies paid to BSES Limited).

Schedule 27 to the Levies Act also contains generic maximum levy rates for all plant products. Plant levies must not exceed the greater of:

- (a) \$5 per unit of the plant product
- (b) 5 per cent of the value of the plant product.

It is unclear to the Commission whether tonnes or some other unit would be used to calculate the ‘unit’ limit for sugar cane. But regardless of this uncertainty, under the ‘value’ limit in Schedule 27, for sugar cane selling at \$300 per tonne, the effective maximum levy rate would be \$15 per tonne. Again, this would have little constraining impact on levy rates in a contemporary context.

Moreover, in this latter case, the maximum rate provision appears to have frustrated the wishes of the industry concerned. Specifically, the egg industry voted in February 2009 to increase its levy to 13.5 cents per chick, above the current statutory maximum of 10 cents per chick. The enabling legislation was introduced

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into Parliament in May 2010 and has yet to be approved, eighteen months after the egg industry agreed that the increase was required.

Inquiry participants in other industries also commented on the difficulty of increasing levies above the statutory maximums. For instance, High Security Irrigators Murrumbidgee considered that ‘all RDCs should have adequate “ceiling levels” built in to their levy arrangements to enable the levies to be increased within a range that does not require the lengthy and tedious process of getting legislative approval to have the ceiling increased’ (sub. 16, p. 6).

In the Commission’s view, it is important that the scope for primary producers to fund research of direct benefit to them is not impeded by cumbersome levy change processes. The product-specific maximum levy rates in the Levies Act constitute just such an impediment and should be repealed. Indeed, except for their role of limiting the scope of delegated legislative power (which, as discussed above, is a Parliamentary requirement), it would be hard to justify the retention of the generic maximums in schedule 27 to the Levies Act.

#### DRAFT RECOMMENDATION 9.1

***Product-specific maximum levy rates should be removed from schedules 1 to 26 to the Primary Industries (Excise) Levies Act 1999 (Cwlth).***

### **Separate R&D and marketing levies, or a single industry levy?**

In the horticulture, egg, pork and red meat industries, marketing levies are collected and spent separately from R&D levies — levies collected for R&D must be spent on R&D, and marketing levies must be spent on marketing. However, as mentioned in section 9.2, the dairy and wool industries have a single levy that can be used to fund either R&D or marketing. This is also the case in the forest and wood products industry.

One possible advantage of the latter approach is its potential to increase administrative efficiency. That is, some of the fixed costs for industries in determining levy rates can be spread across a wider levy base. More importantly, a single levy can potentially increase an RDC’s scope to address emerging issues of concern to levy payers, as expenditure can be reallocated from marketing to R&D (or vice versa) without the slow and costly processes of changing the statutory levy rate.

However, the benefits of permitting an RDC to move levy funds between R&D and marketing depend of the quality of the RDC’s management and the effectiveness of



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its governance arrangements. Of particular concern is the possibility that, without appropriate checks, levy payers' funds could be diverted from R&D into lower-value marketing activity. Indeed, if levy payers are not confident that an RDC's management, both current and future, will allocate the combined levy in the best possible way, this could have implications for levy payer support for the levy and for the preferred levy rate.

Given the Commission's proposal to allow statutory RDCs to undertake marketing functions (draft recommendation 8.3), the relative merits of the strict separation or combination approaches deserve further consideration.

#### INFORMATION REQUEST

*The Commission seeks further input on whether R&D and marketing levies should be separate; or combined into a single industry levy, with some scope for a Rural Research and Development Corporation (see draft recommendation 8.3) to vary the allocation of funds between R&D and marketing without seeking the formal approval of levy payers.*

### **Streamlined application of the Levy Principles**

To change a levy rate or create a new levy, industries must demonstrate compliance with the Levy Principles. As noted in section 9.2, a number of industries seeking to change a levy rate or create a new levy have found this to be a slow and difficult process. (Other industry groups to comment in general terms on the cumbersome nature of the current arrangements include the Winemakers Federation of Australia, sub. 21; Ricegrowers Association of Australia, sub. 24; Cherry Growers of Australia, sub. 96; Australian Egg Corporation Limited, sub. 119.) In particular, the costs of conducting ballots of levy payers can be substantial (section 9.2) and the process can be challenging, even for established industries:

The process for comprehensive consultation with levy payers and industry is extremely resource intensive, rather than solely cumbersome, and is faced with many challenges ... (Citrus Australia, sub. 66, p. 7)

Cotton Australia would suggest that the consultation guidelines result in industries delaying small levy increase proposals ... until the quantum of increase required is greater. The cotton industry has not canvassed an increase in the research levy for 10 years during which time CPI increase may well have justified a 30% increase in the grower R&D levy contribution. (Cotton Australia, sub. 68, p. 31)

The burden of demonstrating compliance with the Levy Principles does not appear to stem from the principles themselves. Indeed, the Commission supports the intention of the principles and considers it important to verify that a proposed levy addresses a market failure and is equitable, efficient and supported by the industry.

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However, it is not clear that demonstrating compliance with the Levy Principles should be as onerous as is currently the case. It appears that DAFF has, in practice, interpreted the principles in such a way as to place an excessive burden on levy-paying industries. For instance, the Levy Principles and Guidelines document (DAFF 2009a) indicates that DAFF assesses all proposals to increase a levy against the same principles applicable to a new levy, regardless of the significance of the proposed changes. The experience of Apple and Pear Australia Limited, which proposed a levy increase that was fully offset by a decrease in another levy, provides an illuminating example (box 9.6).

**Box 9.6      Changing the allocation of a fraction of the apple levy**

During 2009, Apple and Pear Australia Limited (APAL) sought to amend apple grower levies to meet the increased subscription costs of membership to Plant Health Australia (PHA). APAL proposed to growers that the PHA levy applied to fresh apples ... be doubled from 0.01 cents per kilogram to 0.02 cents per kilogram and that the R&D levy be reduced accordingly, from 0.73 cents per kilogram to 0.72 cents per kilogram. ... APAL went to considerable effort and expense to ensure that all levy payers were aware of the proposed levy changes and had the opportunity to express a view on the proposals. The effort was consistent with the Levy Principles and involved extensive advertising, direct mailing to growers and eight grower meetings held across Australia. These efforts culminated in a Levy Payers meeting at which voting took place. Due process associated with the Levy Principles was required despite the fact that the rate changes were of a magnitude of one tenth of one cent and that the net impact on growers was zero.

*Source:* Apple and Pear Australia Limited (sub. 86, p. 42).

The Grains Council of Australia — Seed Committee (sub. 45) highlighted that small and new industries face particular challenges in demonstrating compliance with the Levy Principles to the satisfaction of DAFF. The committee also suggested possible ways to streamline compliance with the principles:

Frequently the industry is required to address all of the Levy Principles and Guidelines from the beginning. This should hardly be necessary if a R&D Levy is already in place. For example, pasture seeds should not have to provide a research plan, when we have a program with RIRDC with all its reporting structures. (sub. 45, pp. 36–37)

The Commission concurs, and considers that the burden of complying with the Levy Principles should be commensurate with the magnitude of the proposed levy changes. As such, there appears to be considerable scope to interpret the principles in such a way as to minimise the burden on industry, without compromising the fundamental intention of the principles and the protection they offer against inappropriate changes in levy rates.

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The cumbersome nature of the current requirements appears to stem from the guidelines section of the Levy Principles and Guidelines document. Revision of this document would therefore be a prerequisite for any attempts to reduce the compliance burden. To this end, the Commission recommends that DAFF revise the Levy Principles and Guidelines document, giving particular consideration to reducing the burden for proposed small changes in the levy rate or reallocations of existing levy funds, and to waiving information requirements where such information has already been compiled or provided for other purposes.

A draft of the revised Levy Principles and Guidelines document should be used as a basis for consultation with levy-paying industries.

DRAFT RECOMMENDATION 9.2

***The Australian Government's Department of Agriculture, Fisheries and Forestry should revise the Levy Principles and Guidelines document to ensure that the costs for an industry of seeking a change to a levy are commensurate with the magnitude of the proposed change.***

### **Timely enactment of levy proposals**

The nature of the levy change process means that there are limits on the extent to which the government component of the process can be expedited. For instance, obtaining Parliamentary or Executive Council approval requires due consideration and process. Even so, the examples provided to the Commission (see above) suggest that some of the current delays are excessive.

The Commission contemplated a number of mechanisms for encouraging DAFF and the Minister to expedite proposals for new and changed levies, such as automatic approval of levy proposals after a certain time and 'pre-approval' by levy payers of levy changes within a certain range. However, implementing such mechanisms could pose some significant practical and legal issues.

The Commission also considered whether setting levy rates by Ministerial declaration, rather than by regulation, could make it easier to change levy rates. But this would only address delays which stem from the specific procedural requirements for making regulations, and as such would be unlikely to provide sufficient benefit to justify the extensive amendments to the Levies Act that would be required.

That said, the Commission considers that there would be value in setting indicative time limits to provide the Minister, DAFF and industries with clear expectations

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about how long the government process for implementing new levies and changing levy rates should take. Provided that proposals contain sufficient detail and supporting evidence, and do not require legislative change, the Commission considers that a target of six months would not be unreasonable. Proposals that require legislative change may take longer, although legislative change would be required less frequently if product-specific maximum levy rates were removed (draft recommendation 9.1).

To consistently meet the indicative time limit, DAFF may need to streamline its processes and simplify or abolish some of its current practices. For instance, allowing a six-week period for objections seems excessive as, by definition, the proposed levy changes would already have been approved by a majority of the industry. Likewise, notwithstanding the generally important role of Regulation Impact Statements in encouraging best-practice regulation, the requirement to prepare such a statement appears to add little value to the consideration of levy proposals that have been put forward by an industry. At the very least, the information provided by levy payers should allow for expeditious preparation of this statement.

The Commission recognises that there will be circumstances where a six-month time limit cannot be met. But in such situations, the reasons for the delay should be clear and transparent. Accordingly, as part of the proposed annual monitoring report (draft recommendation 8.7), DAFF should report on how long it has taken to implement proposals for new levies or changes to levy rates, with explanations when implementation has not been finalised within six months.

A related issue is that, in recent years, some industries (particularly the rice industry) which proposed an increase in their R&D levy were only granted a temporary (three or five year) increase. It appears that successive Ministers were reluctant to recommend a permanent levy increase out of fear that such a recommendation might, incorrectly, be perceived as support for higher taxes. However, the effect of such reticence has been to place an additional burden on the industry — in order to maintain the levy at the preferred higher rate after the temporary increase expired, these industries were required to make a new application and hold a new ballot, at considerable cost (see above). The Commission can see no sense in such an outcome.

#### DRAFT RECOMMENDATION 9.3

***An indicative time limit of six months should be introduced for the implementation of new levies, and changes to the rates of existing levies, following the receipt of a complying proposal. As part of its annual monitoring report on the overall Rural Research and Development Corporation program (see***

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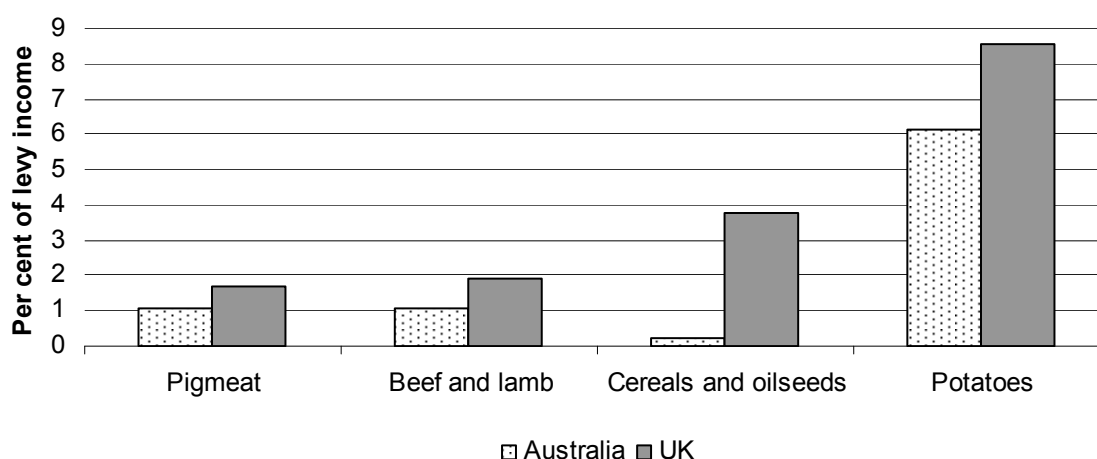
*draft recommendation 8.7), the Australian Government's Department of Agriculture, Fisheries and Forestry should report on its performance against this requirement, and where the requirement has not been met, indicate the reasons for this.*

### Ensuring that levy collection is efficient

As outlined in section 9.1, LRS charges industries for levy collection. While average collection costs are less than one per cent of funds collected, many smaller industries incur much higher collection costs (DAFF 2008). Several inquiry participants expressed concern about collection costs, with High Security Irrigators Murrumbidgee considering that 'the cost of collection of the levies by DAFF has always and probably will continue to be a source of contention within the ranks of most RDCs' (sub. 16, p. 6). Some participants even suggested that, for small industries, 'industry expansion has been limited by the high cost of levy collection by LRS ...' (Peasley Horticultural Services, sub. 13, p. 1).

The LRS has not explicitly examined how its collection costs compare to those of other Australian revenue collection services or similar overseas organisations. Even so, they appear to be lower than costs incurred by comparable entities that collect compulsory levies in the United Kingdom (figure 9.1).

Figure 9.1 **Cost of levy collection for selected agricultural industries, Australia and the United Kingdom, 2008-09**



Sources: AHDB (2009); DAFF (2010a).

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But while the potential for LRS to further reduce costs might be relatively modest, this does not mean it should ignore opportunities for efficiency improvement or fail to monitor whether the distribution of collection costs across industries continues to be fair and reasonable. To this end, the LRS should continue to publish reports on its operations and, importantly, should make these reports available to stakeholders in a timely manner. In addition to detailing the levy collection costs in each industry, the reports should indicate any proposed changes to procedures or cost allocation protocols that would affect the future distribution of costs. As part of this reporting process, LRS could also seek feedback on the effects of, and levy payer satisfaction with, the introduction of Levies Online (a new system for online lodgment of levy returns). The Commission envisages that that this reporting could in turn be an input into the proposed broader monitoring report on the outcomes of the RDC program as a whole (draft recommendation 8.7).

#### DRAFT RECOMMENDATION 9.4

***The Levies Revenue Service should routinely monitor its performance and the costs of collecting levies, and promptly communicate the results of that monitoring — along with details of any proposed changes to its procedures or cost allocation protocols — to stakeholders.***

## 9.4 Should levies be imposed on processors?

As noted in chapter 2, in several rural industries, processors pay R&D and marketing levies. These include:

- saw millers, who pay levies to Forest and Wood Products Australia
- sugar millers, who contribute half of the industry funding to the Sugar RDC
- wineries, who pay levies to the Grape and Wine RDC
- meat processors, who have formed their own RDC, the Australian Meat Processor Corporation.

However, most processors of primary products do not pay statutory levies and thus do not contribute, through this route at least, to the cost of R&D and other services provided by RDCs. In fact, in some horticultural industries, reduced levy rates or levy exemptions apply to produce destined for processing.

Several inquiry participants suggested that, as a general principle, processors should be required to pay levies (for example, CSIRO sub. 123; Department of Agriculture and Food Western Australia, sub. 137; Grain Industry Association of Western Australia, sub. 143). Similarly, DAFF (sub. 156) suggested that processor levies

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could stimulate increased investment in rural R&D, although it did not elaborate on this contention.

As discussed in chapter 3, levies can be a useful mechanism to address free riding. However, the extent of the free-rider problem will depend on the nature of the industry, the products it sells and the processes it uses.

Significantly, there are only a small number of processors in many agricultural industries. For instance, there is a high degree of concentration in processing of pork (Sheales, Apted and Ashton 2004), dairy (Seyoum et al. 2003) and vegetables (Apted 2006). Even in the wine industry, in which there are thousands of winemakers, the 13 largest account for 75 per cent of wine production (ABS 2010a). This concentration, combined with the fact that processing can often involve proprietary technology and takes place indoors (rather than in open fields), means that processors are more likely to be able to exclude rivals from learning about their R&D efforts, at least in the short term. Indeed, the Australian Meat Processor Corporation suggested that many meat processing firms have substantial in-house R&D programs (sub. 111, pp. 25–27). Likewise, in the chicken meat sector, processors make substantial direct investments in their own R&D (Australian Chicken Meat Federation, sub. 77). Such investment would be unlikely if free riding were a significant issue. Therefore the need to address the free-rider problem is unlikely to provide a sufficient, or even a good, justification for extending processor levies to other industries.

Other inquiry participants expressed support for processor levies based on notions of fairness (for instance, Australian Centre for Plant Functional Genomics, sub. 15; Australian Academy of Technological Sciences and Engineering, sub. 37). The views expressed were similar to those of the Low Rainfall Collaboration Project, which considered that ‘processors benefit from improvements in production, quality or stability of supply so it seems logical that they should make some contribution back to the RDCs ...’ (sub. 14, p. 6).

However, if processors have market power in dealing with primary producers (which is often the case, given the high degree of concentration in processing discussed above), then processor levies are likely to be passed back to producers in the form of lower prices for the primary product. Thus, the Australian Superfine Wool Growers’ Association considered that ‘the inevitable result of any levy downstream is that it largely falls back on the producer at farm level’ (sub. 9, p. 42). Likewise, while the South Australian Grain Industry Trust (sub. 11) and the Tasmanian Department of Primary Industries, Parks, Water and Environment (sub. 148) supported processor levies, they acknowledged that the cost would be

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more than likely passed back to producers. Such perceptions are also consistent with overseas experience:

The levy is, it may be argued, borne in its entirety by primary producers. In these particular markets, where primary producers and first stage processors are all price takers, the levy is merely ‘shifted’ back to primary production. (Radcliffe 2005, p. 89)

If there is pass-back, and if primary producers believe that their current levy payments are sufficient, the introduction of compulsory processor levies could simply lead producers to vote to reduce their levy contributions. As such, processor levies would neither induce processors to pay their ‘fair share’, nor increase the total level of R&D funding available. Moreover, as AWI highlighted, in industries in which a large share of processing takes place overseas, ‘the practicality of introducing a system to encourage processor contributions is questionable’ (sub. 110, p. 55).

For these reasons, the Commission is not persuaded that there is a case for extending statutory processor levies beyond their current application.

The preceding discussion also calls into question the case for continuing to provide government matching contributions for levy payments currently made by some processors. However, the Commission does not consider that the immediate withdrawal of such matching contributions would be advisable.

- First, the industries which already have processor levies may differ in their traditions, practices or characteristics from industries which do not have such levies. To the extent that these differences reduce processors’ ability to pass levies back to primary producers, or to exclude rivals from learning about R&D results, the case for processor levies may be strengthened. For instance, the Sugar RDC submitted that ‘the millers’ share of the levy is not recouped from growers’ (SRDC sub. 140, p. 9), suggesting that this common disadvantage of processor levies has not been perceived as a problem in the sugar industry.
- Second, removing the matching contribution for processor levies would add to the adjustment pressures that would arise from the Commission’s proposals to reconfigure the RDC model and reduce funding for the industry-specific RDCs.<sup>2</sup> The proposed phase-in arrangements for the funding reduction have been carefully calibrated to give time for industry funding to replace at least part of the lower government contribution. Adding to those pressures by removing this particular component of current government support would therefore not, in the Commission’s view, be appropriate, in the short term at least.

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<sup>2</sup> This would be true even if levies are fully passed back. This is because it would take some time for primary producers in those industries that currently have processor levies to increase their levy rates to compensate for the removal of payments by processors.



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Rather, the Commission considers that this component of current RDC arrangements would be better revisited as part of the review of the proposed new RDC arrangements (section 9.7). In the meantime, however, no new statutory R&D levies on processors should be introduced.

DRAFT FINDING 9.1

*R&D levies on processors should not be extended beyond their current application.*

## **9.5 Should matching public funding continue to be provided for non-levy contributions?**

In the red meat and horticulture industries, non-levy contributions towards R&D made by processors, growers or other participants in the supply chain may be eligible for government matching contributions, provided the RDCs have not exceeded the general caps on such contributions (chapter 2). The efficacy of these non-levy contributions (or donor company arrangements) raises some competing considerations. (It is, however, important to distinguish the matching arrangements for these non-levy contributions from the matching of voluntary levies paid to RIRDC by various small and emerging industries.)

Several inquiry participants favoured retaining government matching of voluntary contributions (for instance, the Australian Centre for Lifestyle Horticulture, sub. 40; Cherry Growers of Australia, sub. 96), or advocated extension of such funding to other industries (for instance, Southern Tree Breeding Association, sub. 38; Cotton Australia, sub. 68; FWPA, sub. 139; Queensland Government, sub. 153). They noted that the availability of matching funding from the Government can be a means to leverage additional private investment from domestic sources and both public and private investment from overseas. In the latter context, HAL noted that promoting collaboration with overseas firms and researchers can enhance Australian research capacity and enable larger research projects to be undertaken (HAL 2009). Moreover, where voluntary contributions are paid by groups of primary producers there may be little to differentiate the arrangement from matching of a statutory levy.

On the other hand, where matching is provided in return for a contribution from an individual entity, it is more likely that the government funding will subsidise R&D that is heavily oriented to the particular needs of that entity. As such, it will be less likely that the R&D will provide the sort of benefits to other parties that would justify a public funding contribution. Moreover, where overseas entities are

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involved, a possibly substantial part of any wider benefits supported by the government contribution may flow overseas.

Were the current levels of funding for the industry-specific RDCs to be maintained, the latter considerations would, in the Commission's view, call into question the continuation of such arrangements. However, if funding for the industry-specific RDCs is reduced in line with the Commission's proposals (chapter 7), there will be considerably less room in the system for contributions and matching of this nature. Accordingly, any need for action in this area would be diminished.

## **9.6 Are all levy payers receiving sufficient benefits?**

The terms of reference ask the Commission to consider whether all industry participants are receiving appropriate benefits from their levy contributions.

There are various possible dimensions to this question, including the comparative distribution of benefits between small and large levy payers, or between innovative levy payers and those who are slower to adopt new technologies and practices. (A handful of inquiry participants also raised concerns about levy contributions being spent on research relevant to a general class of crops (such as grains) rather than targeted to a specific crop (such as wheat) — though this ignores that such general research could benefit growers of all crops in that class.)

However, the main concern of this nature appears to be about the regional distribution of benefits from levy contributions.

Several RDCs go to considerable lengths to take differing regional research needs into account in developing their research portfolios. For instance, as noted in chapter 4, MLA (sub. 106) consults with northern and southern beef research councils and the Grains Research and Development Corporation (sub. 129) has northern, southern and western regional panels which provide advice on strategic issues and investment priorities.

There is of course a need for RDCs to also take regional differences into account in their extension activities. Indeed, the regional nature of much extension activity is encapsulated in the National Primary Industries RD&E Framework (DAFF 2010b). Moreover, the rate at which research is adopted may be influenced by where it is undertaken (see NSW Farmers Association, sub. 145), in turn suggesting that RDCs should aim to ensure some regional spread in where projects are conducted as well as in the intended benefits.

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That said, most of the regionally-related concerns about the RDCs' current activities were to do with the distribution of research benefits. For example, the Pastoralists and Graziers Association of Western Australia — Western Graingrowers reported that 'there have been complaints by producers in Western Australia that levy dollars research is East-centric' (sub. 115, p. 22). Likewise, WA Grains Group expressed concern that 'the regions who produce the income do not gain anywhere near proportional investment back into the commodity that generated the income' (sub. 61, p. 10). More broadly, the Department of Industry and Investment NSW said that 'the current methods of distribution predisposes to under-investment in states (like NSW) where there is a very diverse industry base ...' (sub. 69, p. 17). (Others to raise concerns of this nature included the Department of Agriculture and Food Western Australia, sub. 137; Grain Industry Association of Western Australia, sub. 143; Evergreen Farming, sub. 152.)

However, other inquiry participants explicitly refuted the notion that, in their industries, there has been a mismatch between the regional distribution of levy payments and the regional distribution of benefits from the ensuing R&D. (See, for example, Wool Producers Australia, sub. 48; Apple and Pear Australia Limited, sub. 86.) One participant said that while such problems had existed in the wine industry, they had been resolved (High Security Irrigators Murrumbidgee, sub. 16).

For its part, the Commission considers that a serious imbalance in the regional distribution of benefits from RDC research — or insufficient attention to regionally-related extension activities — would be problematic. In particular, it could lead producers to vote to reduce (or even discontinue) levy payments, thereby threatening the future viability of the co-investment model. The Commission notes that partly because of concerns about the regional distribution of research benefits, the Pastoralists and Graziers Association of Western Australia and Western Graingrowers (sub. 115) suggested the removal of R&D levies.

However, notwithstanding the concerns of some inquiry participants, the Commission has not seen evidence that the current regional distribution of benefits of RDC research is such as to entail significant risks of this nature. Though producers in some States have opted to pay State-specific research levies, this does not appear to be a reflection of dissatisfaction with research outcomes from the national levy regime. Thus the South Australian Grain Industry Trust (SAGIT) observed that:

There is no evidence that the availability of SAGIT funds replaces GRDC investment. In fact it is quite the opposite in that SAGIT usually takes the initiative to co-fund with GRDC projects of national significance. (sub. 11, p. 4)

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In the absence of any major imbalance, any effort to ‘regionally fine-tune’ research portfolios — or where research is undertaken — is likely to be counterproductive from the point of view of the rural sector as a whole and the wider community. In particular, it could require a shift in investment towards projects that might provide a lesser overall return. In addition, if a regional fine-tuning of research portfolios resulted in a greater proportion of smaller, more applied projects, it would limit the funds available for larger projects that could potentially provide much bigger gains for both producers and the wider community.

In any event, given the inherent uncertainty about the outcomes of any R&D project, there is no guarantee that such regional fine-tuning would have the desired effects. Any such changes could also run counter to the National Primary Industries RD&E Framework initiative to rationalise research funding and delivery across States and Territories.

DRAFT FINDING 9.2

*Rural Research and Development Corporations (RDCs) should continue to recognise and cater for differing regional research needs. However, RDCs should not be required to more precisely calibrate the expected regional distribution of the benefits of their project portfolios with the regional distribution of levy payments. Similarly, in determining the regional spread of their spending with research suppliers, RDCs should be cognisant of the intent of the National Primary Industries RD&E Framework.*

## **9.7 Reviewing the proposed new RDC arrangements**

This report contains a series of proposals to improve the efficiency and effectiveness of the RDC model from the point of view of the community as a whole. The Commission acknowledges, however, that the effects of the proposed changes cannot be predicted with precision. For instance, a measure of uncertainty necessarily attaches to the effect of the proposed changes on the overall level and mix of R&D sponsored by the RDCs, the rate at which such R&D is adopted and the community-wide benefits that would ensue. Moreover, given the other reviews of the rural R&D framework that are currently underway (chapter 1), additional reforms and adjustments are likely to be made to the framework in coming years. Such changes could have implications for the RDC arrangements, over and above the changes proposed by the Commission.

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The Commission therefore considers that, after a sufficient time period, there should be an independent public review of the impact of the proposed new RDC arrangements. A key component of this review would be an assessment of the extent to which the new arrangements, and in particular the establishment of Rural Research Australia, has promoted a greater focus on inducing additional R&D of benefit to the rural sector as a whole and to the wider community. Importantly, in assessing the value derived by the community from the government's funding contribution to the RDC program, the review would be able to draw on improved data on rural R&D funding in Australia (see draft recommendation 5.3), though the extent of that improvement should itself be assessed in the review.

The review would also allow for consideration of:

- further changes that may be required to enhance the administrative efficiency of the RDCs, in light of any changes that may have occurred in the wider rural R&D framework
- whether it would be appropriate to make industry representation a generally allowable function for any RDC
- the effectiveness of the proposed new mechanism for coordinating Australian Government funding for rural R&D
- whether processor R&D levies should continue to be eligible for matching government contributions
- the effects of statutory requirements for formal review of levy rates, and whether these requirements have been effective in ensuring that rates are adjusted to meet contemporary industry needs. This could include consideration of other approaches for review and adjustment of levy rates, such as levy ranges, more frequent levy reviews, or replacing separate R&D and marketing levies with a single industry levy.

However, before the effectiveness of the new arrangements are examined and consideration is given to any further changes that might be required, it is important that RDCs and their levy payers have had a realistic opportunity to respond to the changed environment. As the proposed reduction in public funding support would be phased in over ten years (chapter 7), the Commission recommends that the independent, public review be conducted no earlier than the eleventh year. In addition to allowing adequate time for RDCs and their levy payers to adapt to the new arrangements, such a timeframe would remove any confusion that could arise if the review were to be conducted at a similar time as the levy rate reviews that will be needed by 2016 (see box 9.4).

*At the end of the ten-year phase-in period for the new arrangements governing the funding and operation of the Rural Research and Development Corporations (RDCs), there should be a further independent and public review. Amongst other things, that review should examine:*

- the impact of the new arrangements on the overall level and mix of R&D sponsored by the RDCs, the rate of uptake of research outputs by primary producers, and the resulting benefits for the community*
- the extent to which the new arrangements, and especially the establishment of Rural Research Australia, have helped to increase the amount of additional, socially valuable, R&D induced by the Government's funding contribution to the RDC program*
- the extent to which the proposed new data collection arrangements have helped to improve the transparency of funding and spending flows within the framework*
- the effectiveness of the proposed new mechanism for coordinating Australian Government funding for rural R&D*
- the case for making industry representation a generally allowable function for any RDC*
- the arguments for and against continuing to provide government contributions for levies paid by processors*
- the effectiveness of the statutory levy rate review requirements in helping to ensure that rates remain contemporary to an industry's R&D needs*
- the implications of changes in the wider rural R&D framework for the RDC arrangements.*

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## A Public consultation

In keeping with its standard practice, the Commission has actively encouraged public participation in this inquiry.

- Following receipt of the terms of reference on 15 February 2010, it advertised the inquiry in major metropolitan and rural press and sent a circular to likely interested parties.
- In early March 2010, it released an issues paper to assist those wishing to make written submissions. Some 163 written submissions were subsequently received (table A.1). These submissions are available online at: [www.pc.gov.au/projects/inquiry/rural-research/](http://www.pc.gov.au/projects/inquiry/rural-research/).
- As detailed in table A.2, it met informally with a wide range of stakeholders across Australia. It also met with various parties in New Zealand to better understand the funding arrangements for rural R&D in that country and any lessons their experiences might provide for Australian policy settings.

The Commission thanks all those who have contributed to this inquiry and now seeks additional input. It welcomes further submissions to discuss the substance of the draft report, including responses to the information requests, draft recommendations and findings. The Commission also invites participation in public hearings to be held during November 2010. Details of these consultation processes can be found on p. III.

**Table A.1 Submissions**

<i>Participant</i>	<i>Submission number</i>
Academy of the Social Sciences in Australia	26
Across Agriculture	116, 163
Agar, Colin	17
AgForce Queensland	74
Agricultural Research Development Education and Planning	108
Agriculture and Horticulture Development Board	146
Agrifood Skills Australia	99
Animal Health Australia	136
Apple and Pear Australia Limited (APAL)	86
ATTIA Limited	79
Auscott	5
Australian Academy of Science	35
Australian Academy of Technological Sciences and Engineering (ATSE)	37
Australian Beef Association (ABA)	154, 162
Australian Biosecurity Cooperative Research Centre (ABCRC)	29
Australian Buffalo Industry Council	95
Australian Centre for International Agricultural Research (ACIAR)	118
Australian Centre for Lifestyle Horticulture	40
Australian Centre for Plant Functional Genomics	15
Australian Chicken Meat Federation	77
Australian Dairy Industry Council	135
Australian Egg Corporation Limited (AECL)	119
Australian Fisheries Management Authority	41
Australian Fodder Industry Association	93
Australian Green Tea	138
Australian Honey Bee Industry Council	7
Australian Institute of Agricultural Science and Technology (AIAST)	12
Australian Land Management Group	103
Australian Livestock Export Corporation (LiveCorp)	57
Australian Livestock Exporters Council	121
Australian Lot Feeders Association (ALFA)	19, 147
Australian Meat Industry Council (AMIC)	104
Australian Meat Processor Corporation (AMPC)	111
Australian Mushroom Growers Association	155
Australian National University	43
Australian Native Food Industry Limited (ANFIL)	32
Australian Nut Industry Council	49
Australian Olive Association	97
Australian Plantation Products and Paper Industry Council	142
Australian Pork Limited (APL)	117
Australian Racing Board	133
Australian Seafood Cooperative Research Centre	150
Australian Superfine Wool Growers Association	9
Australian Wine Research Institute (AWRI)	82
Australian Wool Growers Association (AWGA)	73

(Continued next page)



**Table A.1** (continued)

<i>Participant</i>	<i>Submission number</i>
Australian Wool Innovation (AWI)	110
Beynon, Noel	6
Birchip Cropping Group	84
BSES Limited	42
Canegrowers Australia	51
Carbon Coalition Against Global Warming	125
Cattle Council of Australia	83, 149
Cherry Growers of Australia	96
Citrus Australia	66
Commonwealth Fisheries Association	102
Composite Group	159
Cooper, Kath	22
Corporate Agriculture Group	134
Corporate Development Institute	151
Cotton, Richard	58
Cotton Australia	68
Cotton Research and Development Corporation (CRDC)	114
Cooperative Research Centre for Beef Genetic Technologies	62
Council of Rural Research and Development Corporations (CRRDC)	128
CSIRO	123
Dairy Australia	130
Dairy Futures CRC	78
Davies, Richard	56
Department of Agriculture and Food — WA	137
Department of Agriculture, Fisheries and Forestry (DAFF)	156
Department of Fisheries — WA	44
Department of Industry and Investment — NSW	69
Department of Primary Industries — Victoria	161
Department of Primary Industries, Parks, Water and Environment — Tasmania	148
Environmental Farmers Network	47
Evergreen Farming	152
Fischer, Tony	25
Fisheries Research and Development Corporation (FRDC)	113
Forest and Wood Products Australia (FWPA)	139
Forestry SA	71
Forestry Tasmania	67
Gene Ethics	120
Grain Industry Association of WA (GIWA)	143
Grain Growers Association	160
Grains Council of Australia	45
Grains Research and Development Corporation (GRDC)	129
Group of Eight	105
Growcom	122
Grape and Wine Research and Development Corporation (GWRDC)	126
High Security Irrigators — Murrumbidgee	16

(Continued next page)

**Table A.1** (continued)

<i>Participant</i>	<i>Submission number</i>
Horticulture Australia Limited (HAL)	101
Independent Commodity Services	8
Indigenous Land Corporation	157
Ingram, Robert	98
Irrigation Australia	90
Karlsson, John	20
Keniry, John	80
Landscape Queensland Industries Association	36
Lindsay, David	76
Low Rainfall Collaboration Project	14
Lucerne Australia	46
Macyk, Don	124
McGregor, Bruce	60
Meat and Livestock Australia (MLA)	106, 158
Mirrabooka Farms	81
Murray Valley Citrus Board	31
Nason, Charles	2
National Aquaculture Council	33
National Farmers' Federation (NFF)	109
National Program for Sustainable Irrigation	70
National Seafood Industry Alliance	144
Native Seeds	10
New Rural Industries Australia (NRIA)	39
Northern Territory Seafood Council	30
NSW Farmers Association	145
Nursery and Garden Industry Australia	87
O'Donnell, Carol	4
Passioura, John	72
Pastoralists and Graziers Association of WA (PGA) and Western Graingrowers	115
Pearson, Stuart	34
Peasley Horticultural Services	13
Price, Simon	94
Queensland Farmers' Federation	112
Queensland Government	153
Queensland Murray Darling Committee	52
Queensland University of Technology	18
Ricegrowers Association of Australia	24
Rice Marketing Board for the State of New South Wales	28
Rogan, Ian	1
RSPCA Australia	75
Rural Industries Research and Development Corporation (RIRDC)	92
Schmidt, Gil	127
Sheepmeat Council of Australia	100
South Australian Farmers Federation	85
South Australian Grain Industry Trust (SAGIT)	11

(Continued next page)

**Table A.1** (continued)

<i>Participant</i>	<i>Submission number</i>
South Australian Murray–Darling Basin Natural Resources Management Board	91
South East Asian Livestock Services	132
Southern Tree Breeding Association (STBA)	38
Stahmann Farms Enterprises	23
Sugar Research and Development Corporation (SRDC)	140
Tasmanian Farmers and Graziers Association	89
Tasmanian Institute of Agricultural Research	3
Tasmanian Seafood Industry Council	54
Telaheni, John Ive	63
University of Adelaide	55
University of Melbourne	50
University of Sydney	53
Victorian Catchment Management Council	131
Victorian Farmers' Federation	27
Victorian Farmers' Federation — Grains Group	64
Victorian Farmers' Federation — Livestock Group	65
WA Grains Group	61
Western Australian Farmers' Federation	88
Wellard Rural Export	107
Western Australian Fishing Industry Council	141
White, Barry	59
Winemakers Federation of Australia	21
WoolProducers Australia	48

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**Table A.2 Visits**

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***Participant***

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**ACT**

Australian Bureau of Agricultural and Resource Economics  
Australian Centre for International Agricultural Research  
Australian Pork Limited  
Campbell, Andrew  
Cooperative Research Centres Association  
Council of Rural Research and Development Corporations  
CSIRO (video conference)  
Department of Agriculture, Fisheries and Forestry  
Department of Finance and Deregulation  
Department of Prime Minister and Cabinet  
Fisheries Research and Development Corporation  
Grains Council of Australia  
Grains Research and Development Corporation  
Hussey, Denis  
National Farmers' Federation  
Rural Industries Research and Development Corporation  
Rural R&D Council  
Sheepmeat Council of Australia  
Treasury  
Trebeck, David

**New South Wales**

Auscott  
Australian Beef Association  
Australian Cotton Research Institute  
Australian Egg Corporation Limited  
Australian Livestock Export Corporation (LiveCorp)  
Australian Meat Processor Corporation  
Australian Wool Innovation  
Clyde Agriculture  
Cooperative Research Centre for Sheep Industry Innovation  
Cotton Australia  
Cotton Catchment Communities Cooperative Research Centre  
Cotton Research and Development Corporation  
Department of Industry and Investment — NSW  
Horticulture Australia Limited  
Kirkup Farms  
McWilliams Wines Group  
Meat and Livestock Australia  
Miller, Geoff  
Ricegrowers Association of Australia/SunRice  
University of New England

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(Continued next page)

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**Table A.2** (continued)

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*Participant*

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**Northern Territory**

Department of Resources — NT (video conference)

**Queensland**

AgForce

Agri-Science Queensland

Australian Cane Farmers Association

Australian Canegrowers Council

Australian Prawn Farmers Association

Australian Sugar Milling Council

BSES Limited

Canegrowers Australia

Cotton Australia

Department of Employment, Economic Development and Innovation — Queensland

Queensland Farmers' Federation

Sugar Research and Development Corporation

**South Australia**

Australian Wine Research Institute

Grape and Wine Research and Development Corporation

Primary Industries and Resources SA

South Australian Research and Development Institute

Thomas, Geoff

**Tasmania**

Department of Primary Industries, Parks, Water and Environment — Tasmania

Huon Aquaculture Group

Spring Bay Seafoods

Tasmanian Aquaculture and Fisheries Institute

Tasmanian Institute of Agricultural Research

**Victoria**

ACIL Tasman

Australian Dairy Farmers

Australian Dairy Products Federation

Dairy Australia

Department of Primary Industries — Victoria

Forest and Wood Products Australia

Keniry, John

Melbourne School of Land and Environment

Primary Industries Climate Change Centre

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(Continued next page)

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Table A.2 (continued)

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*Participant*

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**Western Australia**

Council of Grain Growers Organisations  
Department of Agriculture and Food — WA  
Kondinin Group  
Murdoch University  
Pastoralists and Graziers' Association  
Western Australian Farmers' Federation

**New Zealand**

AgResearch  
Beef and Lamb New Zealand  
Federated Farmers of NZ  
Fonterra  
Foundation for Research Science and Technology  
Livestock Improvement Corporation  
Meat Industry Association  
Ministry of Agriculture and Forestry  
NZ Bio  
Plant and Food Research

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## B Quantitative studies on the benefits of investment in rural R&D

This appendix supplements the discussion in chapter 3 on the benefits of rural research and development (R&D), drawing on relevant material from the Commission's 2007 study into public support for science and innovation. It summarises commonly cited estimates on the returns from investment in rural R&D (section B.1) and notes important methodological issues and other complicating factors that may affect the precision of these results (section B.2). To conclude, it identifies some of the key themes that have emerged from the quantitative research (section B.3).

### B.1 Estimating returns from investment in rural R&D

Box 3.2 in chapter 3 provides a high level summary of the major empirical work on the returns from rural R&D. To expand on this:

- An analysis by Alston et al. (2000) of over 1000 estimates compiled from nearly 300 studies from around the world (published between 1953 and 1998) found an average 81 per cent return to investment in rural research and extension, with a median return of 44 per cent. For research-*only* projects, the average estimated return was 100 per cent, with a median of 48 per cent.
- In an Australia-specific context, Mullen and Cox (1995) found returns from investment in rural R&D of between 15 and 40 per cent. Using updated data, Mullen (2007) again found this range of returns to be representative for Australian investment in rural R&D.
- The Commission's own research has broadly supported the findings of Mullen and Cox (1995).
  - Shanks and Zheng (2006), which helped underpin the analysis in PC (2007), calculated a 24 per cent return on investment in rural R&D.
  - PC (2007) also surveyed 42 different econometric studies from Australia and overseas (sourced, respectively, from IC 1995 and OTA 1986), estimating an average return on investment of 57 per cent, with a median of 43 per cent.

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There has also been some other recent empirical work that can inform analysis of the returns from rural R&D:

- An evaluation for the Council of Rural Research and Development Corporations (CRRDC 2010) reported that every \$1.00 invested through the Rural Research and Development Corporations (RDCs) returned (on average) \$10.51 after 25 years.<sup>1</sup> The evaluation further indicated that the benefits can materialise quickly, with 60 per cent of RDC projects generating a positive return after five years, rising to 77 per cent after ten years. Moreover, environmental and social benefits were not generally included in the estimates, implying potentially greater returns still.
- As a point of comparison, the Australian Centre for International Agricultural Research (ACIAR) — which funds research intended to improve agricultural performance in developing economies — also has a process for evaluating its R&D program. Even with the narrowest of assumptions (requiring ‘substantial demonstration of benefits’ attributable to ACIAR) Raitzer and Lindner (2005) estimated an average benefit–cost ratio of 1.31:1.<sup>2</sup> Furthermore, Pearce et al. (2006) assessed the benefits to *Australia* from ACIAR’s work, finding an average return of \$0.23 for every \$1.00 in benefits accruing to ACIAR’s partner (developing) countries.
- Sheng, Mullen and Zhao (2010) reported that an apparent slow down in the rate of productivity growth in Australian broadacre agriculture since the mid-1990s could, in part, be attributed to reduced public investment in rural R&D (see below). A similar finding was also made by Beddow, Pardey and Alston (2009) at a global level.

## B.2 Caveats and qualifications

The literature on the empirical benefits of investment in rural R&D commonly notes that estimates of the returns to rural R&D are derived using a variety of methodologies. As Alston et al. (2000) demonstrated, the specification of different project evaluations can have a material effect on the reported results. (A selection of measure attributes is reproduced in table B.1.) This in turn means that caution is required in comparing results across studies.

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<sup>1</sup> To derive an approximate rate of return, the benefit–cost ratio can be multiplied by the discount rate (in per cent) (Alston et al. 2000). Hence, for a discount rate of 5 per cent, a benefit–cost ratio of 10.51:1 translates to a rate of return of roughly 53 per cent.

<sup>2</sup> As per footnote 1, this implies a rate of return to ACIAR’s work of 7 per cent.



**Table B.1 Rates of return by measure attributes**

Attribute	Number of estimates <sup>a</sup>	Rate of return					
		Mean	St. dev. (mean)	Mode	Median	Minimum	Maximum
	no.	%	percentage points	%	%	%	%
<b>Real or nominal rate of return</b>							
Nominal	351	70	64	52	51	-2	466
Real	1 302	77	146	46	44	-100	1 736
<b>Nature of evaluation</b>							
Ex ante	405	94	215	49	36	-12	1 736
Ex post	1 367	77	217	46	46	-100	5 645
<b>Average or marginal rate of return</b>							
Average	1 708	82	266	49	38	-100	5 645
Marginal	686	81	98	40	50	-1	1 219
<b>Private or social rate of return</b>							
Private	55	139	500	20	30	0	3 539
Social	1 717	79	201	40	44	-100	5 645
<b>Rate of return reported or derived<sup>b</sup></b>							
Reported	1 683	72	200	46	44	-100	5 645
Derived	89	247	387	1	60	0	1 720

<sup>a</sup> Due to sample exclusions, the total number of estimates for each category will not always be equal.

<sup>b</sup> Refers to whether the rate of return is explicitly reported in the original study or subsequently derived by Alston et al. (2000) from a benefit–cost ratio.

Source: Alston et al. (2000, p. 56).

More specifically, and as the Commission has previously outlined, a range of factors can influence the outcomes of econometric analysis (box B.1). Of these, assumptions regarding the relationship between R&D and productivity growth are of particular significance. Some studies appear to make only a passing acknowledgment of the possible contribution of factors other than R&D to improvements in rural productivity. Others attempt to account for external factors, but generally without a formal basis for decomposing the different sources of productivity growth. For example, Mullen (2007) simply assumed that annual productivity growth consequent on Australian rural R&D would plausibly lie between 1.2 and 2.0 per cent (based on a long-term trend rate for productivity growth in broadacre agriculture of 2.5 per cent per annum).

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### **Box B.1    How much weight can be placed on the results of individual econometric studies?**

Estimating the returns to investment in rural R&D is a difficult exercise, requiring a range of simplifying assumptions. These in turn influence the reliability of results.

In its 2007 report into public support for science and innovation, the Commission outlined some of the major factors that lead to imprecision in results. Among these are:

- model specification issues, arising from the inherent complexity of the relationship between R&D and productivity, which present challenges such as:
  - how to account for other factors that influence productivity growth
  - the appropriate modelling of lags (which are sometimes long) between investment in R&D and the benefits it can generate
  - the best way to measure marginal returns
- data imperfections, including:
  - the relatively limited availability of time series data (particularly in the context of lags, noted above)
  - incomplete data on public investment in rural R&D, and little data on private investment
  - difficulties in the measurement of multifactor productivity
- selection bias, potentially due to:
  - ‘bottom drawer’ effects — that is, studies with insignificant coefficients or inconclusive results not being considered
  - an emphasis on ‘hero projects’ (with particularly high returns) rather than genuinely random project samples.

As the Commission noted in its 2007 report, the consequence of these various factors taken together is that any econometrically estimated return to R&D investment ‘is too imprecise for calibrating funding’ (p. 186). Indeed, recognising that Australian R&D efforts often depend heavily on research conducted overseas, even isolating the precise effect of domestic investment in R&D — whether public or private, rural or non-rural — is virtually impossible.

Nevertheless, the empirical evidence viewed in an overall sense is suggestive of good returns to investment in rural R&D.

### **The Sheng, Mullen and Zhao (2010) study**

An analysis by Sheng, Mullen and Zhao (2010) of the sources of productivity growth in Australia’s cropping and livestock industries is among the more rigorous pieces of work in this area. Emphasising its value, several participants cited the analysis in their contributions to this inquiry (for example, Across Agriculture, sub. 116; Australian Institute of Agricultural Science and Technology, sub. 12;

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Department of Industry and Investment — NSW, sub. 69; Meat and Livestock Australia, sub. 106).

In addition to R&D investment levels, Sheng, Mullen and Zhao tested the explanatory power of other variables including climate, farmer education and the terms of trade. Of all the variables considered, climate was estimated to have the largest effect on rural productivity — consistent with the severe impact of drought conditions. But Sheng, Mullen and Zhao suggested that this on its own did not account for a ‘structural break’ (a fundamental change in the trend) identified in the mid-1990s. They went on to conclude that, of the variables tested, this structural break was best explained by reductions in public R&D investment levels in Australia — particularly when it was assumed that the benefits of rural R&D materialise over a 35 year time span. (Education and the terms of trade were estimated to have been considerably less important factors.)

Taken at face value, these findings would have significant policy implications. However, while the study is a great deal more sophisticated than some of the previous empirical work, the reliability of its findings (and thus its policy value) is diminished by various empirical uncertainties. These include questions about the degree to which both productivity and rural R&D funding have actually declined. As with other studies, broader methodological issues are a further constraint on what conclusions can be drawn.

### *Productivity-related issues*

The evidence suggests that productivity growth rates can vary significantly across individual rural industries. For instance, Sheng, Mullen and Zhao (2010) note that although multifactor productivity growth declined by 2.1 per cent in cropping industries between 1998 and 2007, it increased by 2.8 per cent for beef producers over the same period.

One possible reason for such divergence is that industry-specific innovations can provide ‘bursts’ of high productivity growth before reaching a plateau until the next significant innovation. Viewed in such a way, it is unsurprising that some rural industries would enjoy stronger productivity growth than others at any point in time.

However, productivity outcomes for broadacre agriculture — the subset considered by Sheng, Mullen and Zhao (2010) — appear to have differed from the entirety of the rural sector. While the recent drought has adversely affected virtually all rural industries, the extent to which *underlying* productivity growth (excluding drought-related factors) has slowed for the sector as a whole is far from clear.

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Owing to drought, average multifactor productivity growth in the whole agriculture, fisheries and forestry sector was -1.4 per cent in the five year period to 2007-08 (PC 2009b).

- But as climatic conditions improved in 2008-09, multifactor productivity rose by 14 per cent (ABS 2010b). This was broadly consistent with the patterns of drought in previous productivity cycles, with depressed growth during periods of low rainfall followed by a pronounced ‘bounce’ thereafter.
- Moreover, in each of the preceding three complete productivity cycles prior to 2003-04 (covering the period from 1988-89), annual multifactor productivity growth for agriculture, fisheries and forestry averaged between 3 and 4 per cent (PC 2009b).

Hence, on the whole, the Commission finds the available evidence inconclusive about whether trend productivity growth in the rural sector has actually slowed to any great extent.

### *Funding-related issues*

Although it is commonly perceived that public investment in rural R&D has been declining, the aggregate funding data are deficient in various aspects (chapter 2). Most importantly, while funding from at least some State and Territory Governments appears to have declined, the trend in funding from the Australian Government is less clear. This makes it difficult to categorically conclude that total public funding has fallen significantly over the period covered by the study.

More broadly, in examining the general linkage between productivity and investment in R&D, public and private funding would seem to be largely interchangeable.<sup>3</sup> Hence, even if public investment has fallen over the period covered by the study, conclusions drawn without taking into account what has been happening to private funding could be erroneous. But a paucity of data again precludes any assessment of this nature.

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<sup>3</sup> The ‘average’ productivity-related impact per dollar of public spending on rural R&D may be somewhat different from the impact of a dollar of private spending. This is because some public funding for rural R&D is directed at promoting non-productivity-related goals (for example, better environmental outcomes). However, for productivity-focused research, it should not matter greatly whether the funding comes from public or private sources. Moreover, were there to be any significant difference in this regard, then, for the sort of correlation undertaken by Sheng, Mullen and Zhao, accounting for changes in private as well as public funding for rural R&D would most likely be even *more* important. That is, given the use of some public funds for non-productivity-related research, then (on average) less than a dollar of private spending would most probably be required to offset a dollar reduction in public funding.

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In fact, linking productivity changes only to public investment in R&D may, in terms of the econometrics, potentially raise a ‘reverse causality’ issue — at least as far as the RDC component of public funding is concerned. For many of the industries covered by the RDC arrangements, industry levy revenue will fall during drought periods (due to reduced output), in turn leading to lower matching government contributions.<sup>4</sup> Hence, it is conceivable that reduced productivity growth (induced by drought) could result in lower public investment, rather than the study’s interpretation that reduced public investment has contributed to declining productivity.

Further complicating matters, the data for public R&D investment used in the study appear to exclude only fisheries and forestry, but not other non-cropping or non-livestock forms of agricultural production. That is, the spending data do not seem to cover precisely the same group of industries as the productivity data.

### *Other issues*

An additional consideration with possible implications for the robustness of the study’s results is ‘omitted variable bias’ — that is, the effect of leaving out potentially significant causal factors from the econometric analysis. For example, one common explanation of productivity growth that was not tested in the study is industry rationalisation. Over the last few decades, the rise of larger farming enterprises and the departure of weaker operators have likely had a strong positive impact on the sector’s productivity. However, were the extent of rationalisation to have slowed in recent years, then again the impact of the postulated decline in R&D investment during this period would most likely be overstated. Notably, the Commission has found in previous research that after growing by 1 per cent each year during the early 1980s, average farm size grew at only 0.5 per cent a year in the period through to 2002-03 (PC 2005).

Similarly, given that Australia accounts for as little as two per cent of the world’s total rural R&D (chapter 2), and that Australia draws heavily on research conducted overseas, the fundamental correlation addressed in the study would presumably apply to global R&D levels as well. That is, any global reduction in rural R&D investment should also lead to a decline in productivity growth for Australian rural industries. However, this factor — and its importance relative to the postulated decline in public R&D spending in Australia — was not considered in the study.

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<sup>4</sup> This issue may be partly mitigated by the three year averaging of levy contributions for the purposes of determining government co-investment levels, as well as the accumulation by RDCs of surplus research funds that can be drawn upon in years when new funding is low. However, during prolonged periods of adversity — for example, a multi-year drought — the reverse causality issue discussed above remains relevant to the veracity of the study’s results.

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Notwithstanding all of these empirical uncertainties, the Commission reiterates that Sheng, Mullen and Zhao (2010) provide a sophisticated study, which may provide the basis for further methodological improvements in estimating the returns from investment in rural R&D. Hence, the Commission's intention in the preceding discussion is to highlight the caution required in drawing strong conclusions from the study's findings, not to denigrate what is an intrinsically valuable addition to previous empirical work in this area.

### **B.3 The bottom line**

As the empirical research clearly demonstrates, it is not possible to determine precise returns from past Australian investment in rural R&D. Nonetheless, collectively, the empirical work suggests that there have been significant benefits for Australia from investing in rural R&D, and that the rates of return to such investment have not declined over time.

The Commission notes that the project-based nature of most of the empirical work may result in a systematic upward bias in reported returns. This is because failed projects — and especially those that are terminated early — may not be encompassed by any *ex post* project-specific assessment, while on the flip side, highly successful 'hero' projects may be singled out for evaluation.

However, even using a portfolio assessment to better reflect the whole gamut of different projects, reported returns are still, on average, significantly positive. Alston et al. (2000) found that aggregated assessments (by program or institution) demonstrated returns of between 18 and 45 per cent. Similarly, in a sample of studies that predominantly (though not exclusively) comprised rural R&D projects, PC (2007) reported an average benefit–cost ratio from various portfolio assessments of around 2:1.<sup>5</sup>

That said, positive returns do not on their own indicate how much Australia should be investing in rural R&D, and what share of this should be publicly funded. Nor do they suggest how particular government funding programs should be configured to deliver the best value from public investment. The Commission's views on these matters are set out in chapter 5.

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<sup>5</sup> As per footnote 1, this implies a rate of return of 10 per cent. For context, project-specific assessments (of those within the portfolios analysed) reported a 40:1 benefit–cost ratio — a 200 per cent return — with this result skewed upwards due to the 'extreme' returns reported by some projects in the sample.

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