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Rural Research and Development Corporations

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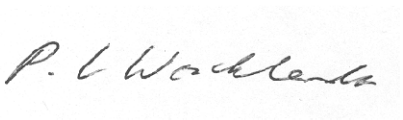
10 February 2011

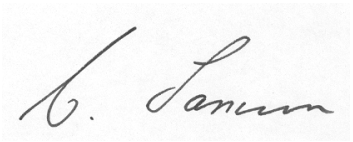
The Hon Bill Shorten MP
Assistant Treasurer
Parliament House
CANBERRA ACT 2600

Dear Assistant Treasurer

In accordance with Section 11 of the *Productivity Commission Act 1998*, we have pleasure in submitting to you the Commission's final report into Rural Research and Development Corporations.

Yours sincerely





Philip Weickhardt
Presiding Commissioner

Dr Cliff Samson
Associate Commissioner

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;

- 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]

Contents

Abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABS	Australian Bureau of Statistics
ACIAR	Australian Centre for International Agricultural Research
AECL	Australian Egg Corporation Limited
AFI	Australian Farm Institute
AGS	Australian Government Solicitor
AMPC	Australian Meat Processor Corporation
APL	Australian Pork Limited
ARC	Australian Research Council
AWI	Australian Wool Innovation
CAC Act	*Commonwealth Authorities and Companies Act 1997 (Cwlth)*
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
FMA Act	*Financial Management and Accountability Act 1997 (Cwlth)*
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
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
PGA	Pastoralists and Graziers Association of Western Australia
PIERD Act	*Primary Industries and Energy Research and Development Act 1989* (Cwlth)
PIMC	Primary Industries Ministerial Council
PISC	Primary Industries Standing Committee
PMSEIC	Prime Minister's Science, Engineering and Innovation Council
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

OVERVIEW

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.
- However, as currently configured, the model has some significant shortcomings.
  - It does not cater well for broader rural R&D needs.
  - The overall level of public support for industry-focused research is too high given the sound financial reasons that producers or industries would have to fully fund much of this research themselves.
  - The basis for the Government's matching contribution to RDCs provides no incentive for producers to increase their investments in the model over time.
- While the broad model should be retained, significant changes to the way in which the Government contributes its funding are therefore called for. Specifically:
  - The current cap on dollar for dollar matching of industry contributions by the Government should be halved over a ten-year period.
  - A new, uncapped, subsidy at the rate of 20 cents in the dollar should be immediately introduced for industry contributions above the level that attracts dollar for dollar matching.
  - A new, government-funded, RDC — Rural Research Australia (RRA) — should be created to sponsor broader rural research. With RRA in place, the other RDCs (except for the Fisheries RDC) should be left to focus predominantly on funding research of direct benefit to their industry constituents.
- These new arrangements would result in a modest reduction in total government funding for the RDC model — though with a similarly modest increase in private contributions, the overall amount of funding available to the RDCs could increase.
  - More importantly, the redistribution of some public money to broader research would deliver better value for the community from its investment in the model.
- These funding changes should be supported by a new set of program principles, setting out the broad obligations on RDCs in return for their public funding and how the Government should discharge its responsibilities on behalf of the wider community.
- Some more specific changes should also be made, including to:
  - enable (though not require) the appointment of a 'government director' to the board of an RDC
  - improve the robustness and transparency of project evaluations, independent performance reviews, and the monitoring of program outcomes by the Government.
- There is also a need for better data on overall rural R&D funding and spending.
  - However, overlaying the framework with a target level of total spending on rural R&D, or a target 'research intensity', would not be appropriate.

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 various other benefits, including better and lower priced food for consumers and improved environmental and animal welfare outcomes.

Many of these benefits come from overseas research that is embodied in imported products and technologies used by primary producers. Also, while some of the rural R&D undertaken in Australia is 'cutting edge', the focus of much of this research is sensibly on the adaptation of global technologies to meet particular local requirements.

Though the available data are far from comprehensive, it appears that current annual funding for rural R&D and related extension activity 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, some processors and the Government. Producers contribute to the cost of this research primarily through statutory and voluntary levies, with most of the Government's contribution provided on a matching dollar for dollar basis. In 2008-09, expenditure by the RDCs on rural R&D and related extension was nearly $490 million, with the Government contributing a little under $220 million to that cost. The RDCs are also able to 'leverage' this expenditure with cash and in-kind contributions from other sources (including other government-funded programs). 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 both in Australia and overseas. Nonetheless, concerns have been raised about aspects of the arrangements — particularly, the extent to which the Government's funding contribution has helped to address unmet rural research

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

Table 1 **Rural R&D funding: where does the money come from?[a]**

Organisation type	*Funding*	*Share*
	million	%
Australian Government		
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	114	
Forgone tax receipts arising from R&D tax concessions	9	
Total Australian Government	*715*	*48*
State and Territory Governments		
Project-related budget allocations	348	
Capital investment in R&D facilities	47	
Payments to other funders and suppliers	21	
Total State and Territory Governments	*416*	*28*
Private/Industry		
Levy payments provided to RDCs	248	
Other (for which a tax concession is claimed)	116	
Total Private/Industry	*364*	*24*
Total	**1495**	**100**

a 2008-09 financial year. Includes funding for related extension activity.

Source: Productivity Commission estimates.

Against this backdrop, the Commission was 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 was also 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. While hard to quantify with any precision, there is little doubt that the overall payoff for both producers and the community from past investments has been significant.

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 entity.)

Most of the current RDCs derive the bulk of their funding from statutory or voluntary levies on primary producers, and in some cases processors, 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.

The RDCs are governed by boards, as well as being subject to various planning, consultation and reporting requirements imposed by the Government in return for its funding contribution. Those industries that pay statutory levies can vote on the rate.

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 selection procedures.
- There is considerable variation in the statutory or voluntary levies through which producers contribute funding to their RDCs. As well, RIRDC and the Fisheries RDC receive 'non-matching' government funding for broader research tasks.

The RDCs operate within a complex 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 incentives 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.

But such payoffs are not sufficient to justify public funding. If a producer can expect to capture sufficient benefits to make investment in a piece of research a financially attractive proposition, 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 — though even this broad argument requires further unpacking.

- Even in the presence of spillovers, public funding support will only be justified where the expected benefits for a producer/industry are insufficient to motivate investment in research that is of net benefit to the community as a whole.
- Public revenue raising has various administrative and efficiency costs. Hence the expected benefit for the community from any public funding for rural R&D must 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.

In addition, it may be possible to ameliorate the impacts of 'policy relevant' spillovers in other ways. In the case of rural R&D, for example, industry levy arrangements have long been recognised as a means to help ensure that all producers who benefit from research contribute to its cost.

However, as a means to address under-investment in rural R&D, producer levies are not a complete solution. In the first instance, their role is to address free-rider problems that could preclude worthwhile investment in R&D of direct benefit to the industry concerned. They are much 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. As well, there are several reasons why producers might not contribute a sufficient amount of funding through levies — or other collective industry contribution mechanisms — even to allow all worthwhile industry-specific research projects to proceed. These reasons are detailed in the body of the report.

Accordingly, government funding support for rural R&D that induces additional, socially valuable research can add genuine value.

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. But such outcomes are not by themselves sufficient reasons for government to contribute to research costs. Here again, a government contribution will only be beneficial for the community if the research concerned would not otherwise proceed.

Public funding principles

As outlined above, the RDC arrangements are only one, albeit very important, part of the rural R&D framework. It is therefore important to guard against the possibility that policy changes based on an assessment of this one part might diverge from those which would have resulted from a review of the entire framework.

One way to greatly lessen risks of this nature is to have in place a generally applicable set of public funding principles against which individual funding programs can be assessed. Indeed, basing public funding (or other forms of intervention) on clear and soundly based principles is widely recognised as being important in delivering good outcomes.

Notably, there is currently no such set of principles to guide rural R&D policymakers. In the Commission's view, remedying this gap would be of considerable value. As well as facilitating effective and consistent assessments of individual parts of the rural R&D framework, introducing a 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.

Central to the Commission's proposed public funding principles is the additionality concept referred to above and elaborated on in box 2. The principles also cover matters such as the relationship of R&D funding programs to 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.

Should these principles be supplemented with aggregate funding targets?

Based on the extensive empirical work looking at the benefits of past investment in rural R&D, it is frequently argued that Australia should be spending more on such research.

Box 2 **Why has the Commission focused on research 'additionality'?**

It is hard to dispute the notion that government funding for the RDCs should be provided in a way that makes a difference to research outcomes. Using scarce public funds to support research that would most probably have been undertaken anyway, would be no less costly than any other wasteful government subsidy.

Application of the additionality concept will of course require those determining and implementing rural R&D funding policies to exercise judgement — especially given that it will not always be easy to predict what impact public funding is likely to have on the level and mix of research undertaken. However, the need for such judgement is hardly unique to this area. Rarely, if ever, will there be sufficient information available to determine precisely how a public funding program should be configured to deliver the greatest benefit for the community. Judgements on likely additionality, even if implicit, are therefore a key element of such policy formulation.

Also, while judgements on the likely additionality effects of government funding will often involve consideration of the relative size of the public and private benefits attaching to particular streams or types of research work, the additionality concept does not lead inexorably to the conclusion that only 'public benefit' research should be supported through the public purse. As noted in the text, if levy arrangements do not fully overcome free-rider problems, publicly supported research that is intended to benefit mainly producers can still be both additional and socially valuable. In other words, the delineation at the heart of the additionality concept is not between public and private benefits. In fact, most successful research projects in the rural sector will deliver a mix of both. Rather, it is between research that producers would have strong incentives to fully fund themselves and those where an appropriate producer/industry contribution is much less likely to be forthcoming.

But for a variety of reasons (see box 3), the Commission is not convinced that the empirical evidence substantiates the case that Australia's overall spending on rural R&D is much lower than it should be. Similarly, it has not seen evidence that the policy framework would in future be unable to mobilise additional funding were this clearly identified as necessary to meet emerging needs.

More importantly, even if it could be categorically established that R&D spending in total were too low, this would still not indicate how individual policies should be changed to deliver good results from a higher level of investment. Nor would it preclude the possibility that public funding for particular policy programs was too high. That is, the appropriate public contribution to individual rural R&D programs would still need to be judged against robust public funding principles — with particular emphasis on whether that contribution was adding genuine value as distinct from simply substituting for private funding.

Box 3 **Some empirical uncertainties**

An extensive body of empirical work strongly suggests that, in aggregate, past investment in rural R&D has provided a significant payoff both in Australia and internationally. Moreover, the large returns reported in most of the more recent studies are not greatly different from those in earlier work. The implication is that a higher level of investment in rural R&D would provide a net gain for the community. Prima facie, recent studies which indicate that a slowing in underlying productivity growth in Australia's broadacre rural industries since the mid-1990s can be partly attributed to a decline in public investment in rural R&D, lend further support to this notion.

However, in the Commission's view, this empirical work cannot sensibly provide the foundation for determining future rural R&D policies.

- As explained in the body of the report, there are a range of general methodological caveats to this sort of work.
- There are also some significant data-related uncertainties that go to the heart of the results of the studies looking at the broadacre experience in Australia.
  - In contrast to the apparent slowdown in trend productivity growth in the broadacre sector since the mid-1990s, ABS productivity data for agriculture, fisheries and forestry as a whole suggest that trend productivity growth has been much more stable over this period. The implication is seemingly that productivity outcomes in the broadacre industries over the last decade and a half may not have been representative of what has been happening across the wider rural arena. Indeed, even the broadacre-specific data reveals considerable diversity in productivity outcomes within this sector.
  - The paucity of robust funding data means that it is difficult to be certain that overall public support has fallen significantly over the period covered by the studies. Though aggregate funding from State and Territory Governments has almost certainly declined, the trend in funding from the Australian Government is less certain.
  - Likewise, because of the data limitations, the studies do not take account of private investment in rural R&D and hence of the extent to which any reduction in public funding has been offset by greater private contribution.

Even ignoring these caveats and uncertainties, the empirical work still provides little guidance on how individual programs should be configured and funded (see text).

Therefore, seeking to supplement the proposed public funding principles with a global spending or research intensity target, or a target government share of total spending, would not be helpful. Indeed, there would be a real risk that such targets could supplant rigorous analysis of the merits of particular policy approaches and funding programs. As the input to this inquiry illustrates, any perception that total spending might be insufficient can quickly become an argument that all existing public funding programs should be inviolate.

How well is the RDC model performing?

Various qualitative and project evaluation evidence suggests that the research 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 research-induced productivity improvements in the sector, there have also been positive environmental and social impacts.

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

- The strong linkages with 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 work likely to be of limited practical value.
- Those same linkages and financial contributions can encourage greater or more rapid uptake of research outputs by 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 considerable expertise in the funding and management of rural research. This would be difficult to quickly replicate within a completely different funding vehicle.

Also, some 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 general considerations and some specific evidence together suggest that the Government's funding contribution is likely to have induced only a modest overall amount of additional, socially valuable research (see box 4).

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. Nor is the Commission suggesting that the level of research additionality has necessarily been modest for every RDC. The natural resource management and other broader research sponsored by RIRDC and the Fisheries RDC is germane in this context. It would also be possible to find individual projects sponsored by almost any of the RDCs for which the government contribution has been the primary driver.

Box 4 **Research additionality within the RDC model**

Given that the basis for public funding for rural R&D should be to induce socially valuable research that would not otherwise have been undertaken, in assessing the RDC model, the Commission has looked closely at the likely 'research additionality' attaching to the Government's funding contribution.

Significant judgement is involved in considering what part of the RDCs' research portfolios might have proceeded without government funding. Also, the degree of research additionality is likely to vary across individual projects and individual RDCs.

Nonetheless, a range of considerations and specific evidence suggest that the overall degree of research additionality has probably been modest.

- As noted, the bulk of the RDCs' research has been aimed at improving the productivity of producers. With levy arrangements in place to help address free-rider problems, there would seemingly often be sound financial reasons for producers to fully fund research of this nature. In contrast, there has been much less investment by most RDCs in broader rural research where the benefits are either thinly spread across a wide range of industries, or accrue primarily to the wider community — and where government funding is therefore more likely to make a difference.
- High estimated benefit–cost ratios for many RDC-sponsored projects reinforce the notion that the incentives for private investment would often have been strong.
- Reflecting these sorts of incentives, the grains, wool and some fishing industries are paying levies to their RDCs that exceed the cap on matching government contributions and for which there is therefore *no* public funding support.
- There are similarly various examples of industries and individual entities investing in productivity-enhancing rural research outside of the RDC model. In fact, it appears that one of the effects of the high rate of support available through the matching contribution regime (see text) has been to draw in research from outside of the RDC tent. In a framework-wide sense, such research is not additional.
- The abolition of LWA and reduced government support for non-industry specific research within RIRDC has shifted public funding out of two of the areas within the RDC model where additionality most likely was/is greatest.

Even so, across the model as a whole, the community does not seem to be getting the best return for its very substantial investment. Put another way, a considerable proportion of that investment appears to be simply replacing private funding — and thereby subsidising research that producers/industries would otherwise most probably have fully funded themselves — rather than making a genuine difference to research outcomes.

A modified RDC model should be retained

The Commission looked at a number of alternatives to the RDC model — including reallocating the Australian Government's current funding to the RDCs to either CSIRO, the universities or departmentally run research programs; or relying solely on the generally available R&D tax incentives.

It concluded that it is highly unlikely that such approaches would deliver as good an outcome for the community. The case for retaining core elements of the model is therefore strong.

But this is not an endorsement of the status quo. The apparently modest level of additional research induced by the Government's funding contribution is reflective of some systemic shortcomings in the current model. The model therefore requires significant reconfiguration.

The model does not cater well for broader rural R&D needs

The RDC model seeks to address broader as well as industry-specific rural research needs. Indeed, this is a key reason for the Government's contribution — public support for R&D where the prospective benefits are spread widely over a range of industries, or would flow mainly to the wider community, is likely to have stronger inducement effects than support for industry-focused research. Reflecting this, the Government has recently been putting greater pressure on the RDCs to invest in more of this sort of research.

However, without substantial changes to the current model, any attempt to achieve a sizeable shift towards broader research will most probably be ineffectual. This is because, with the bulk of the Government's funding contribution bundled with industry payments, any changes to the way government funding is spent will also affect how industry funds are seen to be spent. In these circumstances, exhortations alone are unlikely to overcome the likely resistance from producers (and even some of the RDCs) to a diversion of investment away from industry-focused research.

Significantly, a considerable number of the key stakeholders now accept that changes to the current model are required to better address broader research needs.

The level of public support for industry-focused research is excessive

The higher is the rate of public funding support, the greater should be its likely inducement impact. As noted earlier, government revenue raising has administrative and efficiency costs and there are also various other calls on that revenue. Given

this, it would be hard to justify spending large amounts of public money supporting research that, with the levy system in place to help address free-rider concerns, producers would often have had sound reasons to fully fund themselves.

Judgements on what is 'large' or 'too high' inevitably must have regard to the level of public support for industry-focused research available to other sectors. Significantly, the Commission estimates that:

- The overall level of funding support provided via matching contributions to the RDCs over the last decade has been 10 times greater than the basic 125 per cent R&D tax concession and nearly 3 times greater than the premium 175 per cent tax concession.
- There would be a similarly large disparity under the proposed new R&D tax offsets.

(As explained in the body of the report, alternative measures from participants that sought to portray a smaller, or even no, disparity do not stand close scrutiny.)

The rural sector does have some characteristics that, in combination with deficiencies in the levy system as a means to overcome free-rider concerns, justify somewhat higher public support for industry-focused research than in most other parts of the economy. But these are not sufficient to justify support that is several times greater than is available for comparable research elsewhere.

The public funding 'knife edge' is discouraging additional industry contributions

At present, the government matching contribution is only paid on eligible industry contributions to the RDCs up to the 0.5 per cent of an industry 'gross value of production' (GVP). Thereafter, additional industry contributions attract no government funding (and are not even eligible for the R&D tax incentives).

Yet the case for at least *some* public funding support for industry-focused R&D within the RDC model does not evaporate once this arbitrary level of investment by producers is reached. In fact, this cut-off point for public support sets an unhelpful investment benchmark for producers that has no linkage to the benefits and costs of the research opportunities that are, or may become, available. Notably, the current knife-edge arrangement stands in contrast to the uncapped nature of the R&D tax incentives.

How should these shortcomings be rectified?

Reflecting the above, the Commission's proposals for improving future funding arrangements for the RDC model have three broad planks.

- Levy payers and other industry stakeholders should gradually take on greater responsibility for funding industry-focused research sponsored through the model.
- At the same time, there should be some uncapped publicly funded incentive for industries to increase their investment in the model over time.
- The Government's contribution for broader rural R&D should in some way be managed separately from its contribution for industry-focused research that is linked to levy and other industry payments.

Future funding for the industry RDCs

Several factors bear upon by how much, and over what period, relative funding responsibilities for industry-focused research within the model should be rebalanced. As well as the case for some enduring disparity in public support for such research, there are necessarily uncertainties about:

- the extent to which levy payers and other private parties would increase their investments to offset reduced government funding
- possible flow-on effects for State and Territory Government research funding and for broader rural research capacities
- the degree of pressure in coming years from other changes in the framework.

A degree of caution is therefore called for to help ensure that reductions in support are not excessive, and that the longer-term stability of a highly worthwhile funding model is not put at risk. Also, it would be unfortunate if the effectiveness of the proposed new incentive for producers to increase their investments in the model over time (see below) was undermined by too large a reduction in the Government's total funding contribution in the short to medium term.

At the same time, policy cannot be predicated on the possibility that some, or even many, producers might not respond to commercial incentives to invest more heavily in R&D — especially with those incentives still reinforced through levy arrangements. To seek to compensate for responses that would seemingly be counter to producers' self-interest would be to undermine the normal competitive pressures that reward innovative behaviour and wise investment decision-making, to the detriment of the community as a whole.

Balancing these competing factors, the Commission is proposing that there be:

- a halving over ten years in the cap on the dollar for dollar matching government contribution from 0.5 per cent to 0.25 per cent of GVP
- the immediate introduction of a second tier, uncapped subsidy for levy contributions above the cap at the rate of 20 cents in the dollar.

As this second tier subsidy was not included in the funding proposal in the draft report, the Commission did not have the opportunity to formally test the approach with stakeholders. Nonetheless, concerns about the lack of an incentive for levy payers to maintain or increase their funding contributions to the RDCs were widespread, both before and in response to the draft report. Also, while this second tier subsidy would provide somewhat more generous funding support than the proposed new R&D tax offsets, investing within the RDC model brings with it some added costs. Hence, it is unlikely that this modest assistance differential would, by itself, encourage significant 'importation' of existing rural R&D into the RDC model.

With these changes in place, the Government's contribution to the industry RDCs would gradually decline — based on current industry output values and levy rates, government funding would be some $75 million to $80 million a year lower at the end of the ten-year phase-in. Importantly, however, this would be the maximum reduction. If the second tier subsidy had the intended incentivising effect, and levy contributions increased, there would be a smaller overall reduction in government funding. In addition, with the creation of Rural Research Australia (RRA — see below) there would be much less pressure on industry RDCs to invest in broader research that did not provide direct benefits to producers.

This new funding regime would affect individual industries and their RDCs differently. In particular, in those industries where producers are currently making above-cap contributions (for example, grains and wool), the proposed second tier subsidy would provide for some new public funding dollars — and in effect reward the sort of behaviour that the Commission is seeking to encourage across the industry RDCs as a whole. Also, the Commission has left open the possibility of separate government support arrangements for very small rural industries serviced by RIRDC and Horticulture Australia Limited. Were government funding for these industries to be subject to the proposed general approach, it is possible that there would be insufficient resources available to support even very rudimentary research programs. The Commission is therefore proposing that the future matching contribution regime for these industries be the subject of further consideration between the Government and stakeholders.

Finally, looking to the longer term, the proposed funding arrangements would see industry-focused research within the RDC model still receive very generous public funding support compared to most other Australian industries. Accordingly, the arrangements that the Commission is putting forward for the next 10 years should not necessarily be viewed as the final 'resting point'.

Creating a new non-industry RDC

There is no bright dividing line between industry-focused, productivity-enhancing, rural R&D and research aimed at addressing issues common to many rural industries or meeting needs of the wider community. Nonetheless, as discussed above, the current RDC arrangements have not been particularly effective in directing government funding into research where most of the benefits accrue outside of particular rural industries — and where a public contribution can therefore potentially make an important difference. It is for this reason that the Commission has concluded that there should in future be a separation of the management of government funding for industry-focused and broader rural research within the RDC model.

There are two generic ways in which such separation could be pursued:

- 'earmark' a portion of the government contribution provided to each RDC for use in sponsoring broader rural research, with direction from the Government on how that funding should be spent
- use a dedicated government-funded RDC as the primary vehicle to sponsor such research.

For several reasons, the former approach would be problematic. Most importantly, though industry RDCs can and sometimes do invest in broader rural research, the interests of their producer constituents remain paramount. In light of past investment behaviour and the attitudes that remain in parts of the RDC community, the Commission is simply not convinced that reliance on greater direction from the Government within a still industry-focused setting would be sufficient to prevent the continued subjugation of broader rural research requirements.

There would also be significant difficulties in seeking to augment the current broader research functions of RIRDC (that currently account for just $3 million of the entity's total public funding of $13 million), whilst still leaving it responsible for meeting the research needs of some or all of its current industry constituency. The most likely result would be a potentially dysfunctional amalgam of a major publicly funded broader research program and some small-scale, highly diverse, industry-focused R&D. Moreover, the mooted administrative savings from using

RIRDC rather than a completely new RDC could, to a large extent, be illusory. Were RIRDC to be transformed into an entity charged with sponsoring a major broader rural research program, its board and staffing arrangements and its administrative and consultative processes would all require a major overhaul.

Accordingly, if the Government is serious about having its broader research priorities appropriately addressed within the RDC arrangements, it should create and fund a new RDC — Rural Research Australia — to sponsor non-industry research directed at promoting the productive and sustainable use of resources by Australia's rural industries.

- RRA's precise remit should be determined through a consultative process involving discussions by its board with the relevant areas of the Australian and State and Territory Governments, industry RDCs, major research providers such as CSIRO and the universities, and researchers. RRA's board should then seek the agreement of the Government for its proposed remit and initial research agenda; and the funding appropriation necessary to deliver that agenda.
- In each of the first two years of its operations, RRA should receive seed funding of $5 million. Thereafter, it should be funded under a quadrennial agreement at a level which would allow for implementation of its agreed agenda in a timely way and without excessive reliance on leveraging from other funding sources. While it would not be sensible to specify a longer-term public funding target in advance of the remit-setting process, in establishing RRA, the Government should clearly signal that the new entity is to become an integral part of the RDC regime and that its future funding appropriations will reflect this.

In broad terms, RRA should be subject to the same sorts of governance, reporting and consultation requirements as the other RDCs.

However, reflecting its very different nature, some of the more detailed requirements would be specific to the new entity. In this regard, a particularly important set of requirements will be those that the Commission is proposing to help ensure that RRA engages appropriately with other RDCs and their industry stakeholders. There is little point in undertaking applied research that is not adopted. Involving the industry RDCs in the development and implementation of RRA's research program and extension strategies, and potentially in the delivery of the extension itself, will be crucial if many of those research outputs are to be widely adopted.

Following the establishment of RRA, the industry RDCs should be left to focus predominantly on funding R&D of direct benefit to their producer constituents. Importantly, this change in role would not provide a licence for the industry RDCs

to shift to the short-term, low-risk, adaptive end of the research spectrum. As reflected in the Commission's proposed RDC principles (see below), in return for what would still be a significant amount of government funding, the industry RDCs would be expected to invest in an appropriate amount of longer-term, higher-risk and strategic research. It is this sort of industry research that would more likely be underprovided were there to be reliance on the levy regime alone. Nor would the change of research emphasis obviate the need for the industry RDCs to invest in environmental R&D of relevance to levy payers, or to collaborate with their counterparts and other research entities, including RRA. Even for industry-oriented R&D, collaboration will often be a means to improve efficiency and research quality, and to allow for investment in larger, potentially game-changing, projects. Here again, the Commission is proposing some specific governance changes to ensure that the creation of RRA does not lead the industry RDCs to inappropriately disinvest in these sorts of areas.

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. The Commission has therefore focused in the first instance on developing a set of principles indicating:

- the conditions that should attach to the public funding provided to the RDCs
- how the Government should discharge its obligations so as to assist the RDCs to appropriately perform their roles and also to help ensure that the community receives a return commensurate with its large investment in the model (see box 5).

In addition, the Commission has recommended some specific changes to promote these principles, as well as to further enhance the flexibility of the model, namely:

- reducing Ministerial involvement in the priority setting and planning processes of the industry RDCs
- permitting statutory RDCs (if a majority of levy payers agree) to undertake *industry-funded* marketing activity, thereby removing the current difference with the industry-owned corporations
- allowing 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

Box 5 **Principles to guide the future operation of the RDC program**

As a condition of receiving government funding, RDCs should:

- invest in a project portfolio that appropriately balances long-term and short-term, high-risk and low-risk, and strategic and adaptive research needs
- collaborate, as appropriate, with other relevant RDCs and research organisations in cross-sectoral research
- have in place suitably resourced processes to facilitate 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 relevant information on the outcomes of completed research projects in a timely manner
- through their processes for nominating potential directors and/or engagement with the Government on potential director appointments, facilitate boards that have a suitable balance of relevant skills and experience, rather than a balance of representative interests
- pursue ongoing improvements in administrative efficiency, with regard to both their own activities and those of their research partners
- 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:

- clearly articulate the role of the RDCs within the broader rural R&D framework
- engage openly and constructively with RDCs and other stakeholders
- discharge its administrative responsibilities in relation to the RDC program in a timely and efficient fashion
- verify that nominated representative bodies for each of the statutory industry RDCs remain suitably representative of the industries concerned and are not overly dependant 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.

- making the board of each statutory RDC, rather than the Minister, responsible for appointing its chairperson, thereby removing another current difference with the industry-owned corporations
- requiring all RDCs to continue 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
- extending to statutory RDCs the current requirement for the industry-owned RDCs to commission independent performance reviews every three to five years
- requiring the Department of Agriculture, Fisheries and Forestry (DAFF) to prepare a consolidated, publicly available, annual report on the activities of the RDCs
- making more explicit how DAFF should deal with an under-performing RDC and the steps that should precede any withdrawal of government funding from the RDC concerned.

Effective monitoring and sanctions on under-performance are particularly important as unremediated performance problems within an individual RDC can potentially damage confidence in the model as a whole.

The Commission is also recommending a small number of changes to the levy arrangements — primarily to make it easier for rural producers to increase their contributions and thereby enhance their capacity to fund research that is of direct benefit to them.

Broader framework and review matters

In this inquiry, the Commission's focus has been on the RDC arrangements rather than on how to improve the wider rural R&D framework.

However, beyond the general issue of the basis on which governments should contribute to the cost of rural R&D, two other broader matters have been particularly relevant to the Commission's assessments of the RDC model.

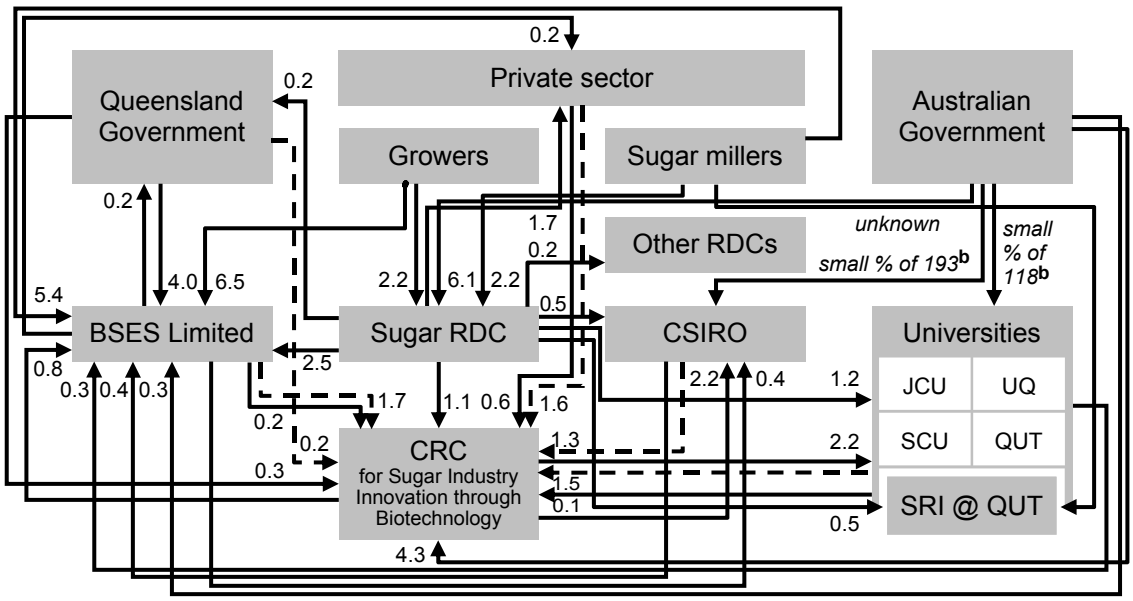
Improving the rural R&D data base

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.

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 in total is

being spent on rural R&D, with whom it is being spent, and which parties are ultimately providing the funding. A particular challenge is unravelling the 'money-go-round' that results from the heavy emphasis on leveraging and collaborative research effort. An illuminating example for the sugar industry is provided in figure 1.

Figure 1 **The sugar industry R&D funding money-go-round[a]**



[a] Funding for R&D in millions of dollars. Dashed lines denote in-kind funding. [b] See table 2.1 in the body of the report.

Though better funding and spending data would not remove the need for judgement on how much governments should be contributing to particular rural R&D funding programs, remedying the current information vacuum would undoubtedly help to improve policy making. DAFF should therefore undertake a scoping study to determine how such funding and spending data might be cost-effectively improved.

Better policy and program 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, there would be value in a 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. An approach suggested by DAFF, which would draw on an existing coordination mechanism in place for the Australian Government's innovation policy as a whole, could meet this requirement at relatively little cost.

Further review of the revised RDC arrangements

The funding and other changes that the Commission is proposing to the RDC model are significant. Especially, given uncertainties about precisely how producers would respond to the modifications to the level and form of government funding for industry-focused research, provision should be made for a subsequent further review.

However, it is also important that there is ample opportunity to bed down the new arrangements before that review is initiated. Notwithstanding the proposed streamlining to the levy change process, adjusting levy rates in response to the new funding environment will still take time. It may also be some time before producers fully come to accept that they are to shoulder a greater share of the responsibility for funding research that is of direct benefit to them. An early review could distract from this necessary change in mindset, and even encourage gaming behaviour designed to garner support for a reversion to the previous regime. The Commission is therefore suggesting that the next review occur at the conclusion of the ten-year phase-in of the new funding arrangements.

Why would the community as a whole be better off?

Implementation of the proposed funding package is unlikely to have large effects on total public funding for, and overall investment in, rural R&D. Were, for example, the budget appropriation for a fully functioning RRA to be of the order of $50 million a year, and without any response from levy payers to the new second tier subsidy, total government funding at the end of the ten-year phasing period would be some $25 million to $30 million a year lower than at present. On this basis, producers would not have to replace a particularly large portion of the reduction in the Government's contribution to the industry RDCs to deliver a neutral or even increased overall rural R&D investment outcome.

Such indicative aggregate funding outcomes are important for putting the Commission's funding proposals in appropriate context and for addressing any claims that the future of either the RDC model or Australia's overall rural R&D effort could be put at risk.

That said, such aggregate impacts are not in fact a good basis for judging the worth of the Commission's reform package. What that package seeks to do is to:

- provide for a more appropriate overall balance between private and public funding responsibilities
- explicitly incentivise producers to increase their investments in the model — one of the major objectives when the RDC arrangements were introduced more than twenty years ago
- address the particular features of the current funding approach that tend to discourage investment in broader rural research.

In addition, the proposed changes would strengthen the performance disciplines on both the RDCs and the Government to the benefit of the rural sector and the wider community — and in a way which built on rather than detracted from the flexibility in the current arrangements.

In sum, and while retaining the core elements of a highly worthwhile funding model, the Commission's reform package would help to ensure that the model delivers efficient and effective research outcomes and that the public contribution makes a real difference to those outcomes. While there continues to be uncertainty about whether the community is getting reasonable value for money from its very sizeable investment, question marks over the future of the model will inevitably remain. Viewed in this light, the proposed reform package provides for a set of measured and gradual changes that should help to cement the RDC model as an important and ongoing part of Australia's rural R&D landscape.

The recommendations at a glance

Recommendation	*Targeted benefits*
Public funding principles	
• Institute a set of high level public funding principles covering: the basis for government to contribute to the cost of rural R&D, the relationship with other policy levers, and good program design features.	• 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 more consistency in funding approaches.
Future public funding arrangements for the industry RDCs	
• Over ten years, halve the current cap on the Government's dollar-for-dollar matching of industry contributions.	• Gradual shift to a more appropriate balance between private and public funding responsibilities for industry-focused R&D.
• Immediately introduce an additional, 20 cents in the dollar, uncapped, matching contribution for industry payments above the cap on dollar for dollar matching.	• Provision of an open-ended incentive for producers to increase their investments in the RDC model, akin to the generally available R&D tax incentives.
• Give further consideration to the matching contribution arrangements for very small rural industries.	• Ensure that a reasonable level of resources is available for research in these industries.
Catering for broader rural R&D	
• Create a new non-industry RDC, 'Rural Research Australia' (RRA), to sponsor broader rural R&D. Leave other RDCs to focus predominantly on research of direct benefit to levy payers.	• Through separation of the Government's funding for broader research, remove the risk that broader research needs will be subjugated to producers' R&D priorities.
• Use a consultative process to determine RRA's precise remit and funding requirements. After an initial period of seed funding, provide RRA's budgetary appropriation through a quadrennial funding agreement.	• Involvement of all relevant stakeholders in the considered development of RRA's research agenda. Protection for RRA against funding cuts motivated by short-term budgetary imperatives.
• Differentiate RRA's governance, reporting and consultation processes to reflect its distinctive nature and to ensure there is effective engagement and collaboration with industry RDCs.	• Facilitation of the effective discharge of RRA's research responsibilities, including through involving producer interests in the research program and aiding adoption of research outputs at the farm level.
Principles to guide the future operation of the RDC program	
• 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.	• Continued 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 RDCs and take effective action where an RDC breaches its obligations.
Specific changes to help give effect to those principles	
• Lessen Ministerial involvement in the priority setting and planning processes of the industry RDCs (other than the Fisheries RDC).	• Greater scope for RDCs to bring their expertise to bear in the formulation of research portfolios and reduced administrative costs.

(Continued next page)

The recommendations at a glance (continued)

Recommendation	*Targeted benefits*
• Allow statutory as well as industry-owned RDCs to take on industry-funded marketing functions.	• Realisation of synergies and administrative efficiencies through the combination of functions.
• Defer assessment of whether industry representation should be a generally allowable RDC function until next review (see below).	• Assessment informed by experience with stronger proscriptions on agri-political activity in statutory funding agreements.
• Enable (though not require) the appointment of a 'government director' to an RDC board.	• Complement existing RDC board skills and improve dialogue with the Government.
• Allow boards of statutory RDCs to elect the chairperson.	• Consistency with good governance practice in regard to promoting effective boards.
• Require all RDCs to continue to participate in a regular, comprehensive and transparent program-wide project evaluation process.	• Better information on project outcomes with flow on benefits for future investments.
• Require all RDCs to commission regular, independent, performance reviews.	• Through extension/augmentation of the existing requirements for industry-owned RDCs, enhance performance disciplines and improve research quality.
• Require DAFF to prepare a consolidated, publicly available, annual report on RDC program outcomes.	• More effective monitoring and identification of performance problems requiring remedial action.
• Make more explicit the escalating sequence of actions that may be taken by the Government to deal with an under-performing RDC.	• Greater clarity for all stakeholders on how performance problems will be addressed by the Government.
Levy arrangements	
• Abolish product-specific maximum levy rates.	• Removal of an impediment to producers taking on a greater role in funding rural R&D.
• Introduce an indicative time limit of six months for implementing a levy proposal that complies with the relevant requirements.	• Increase the discipline on DAFF to process levy change proposals in an expeditious fashion.
• Preclude matching government support for a contribution to an RDC by a single producer.	• Remove scope for public funding support through the RDC model for R&D that is largely of benefit to a single entity.
Framework data collection and program coordination	
• Undertake a scoping study on how to cost-effectively collect better data on funding and spending across the framework.	• Address a significant information impediment to effective policy making in the rural R&D area.
• Establish a mechanism to coordinate the Australian Government's various funding programs for rural R&D.	• Reduced likelihood that decisions to introduce new programs, or modify existing programs, will be made in isolation.
Further review	
• After the new RDC arrangements have been fully implemented, undertake a further, independent, public review.	• Opportunity to examine how effective the new arrangements have been and what further changes might be required.

Recommendations and findings

Public funding principles

RECOMMENDATION 4.1

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***
  - ***have regard to policy levers other than public funding (and any related funding instruments such as compulsory producer levies) for addressing potential under-investment in rural R&D***
  - ***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***
  - ***facilitate collaborative research effort where this would improve the quality of research outcomes or avoid wasteful duplication of research effort***
  - ***help ensure that there are 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***
  - ***facilitate future research efforts by providing for appropriate disclosure and dissemination of research results***

– ***promote transparency in funding flows and discourage leveraging behaviour that is administratively costly relative to the benefits provided, and/or designed solely to shift costs onto other parties.***

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.***

Overall rural R&D spending and funding

FINDING 4.1

Establishing broad targets for overall spending on rural R&D — or a target for rural R&D intensity — would be of little benefit, and could have significant costs were those targets used to 'drive' rural R&D policy settings. 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.

FINDING 4.2

The appropriate collective contribution by Australian governments towards the cost of rural R&D should 'emerge' from:

- *an assessment of each of the various programs through which governments currently contribute funding for such research against the public funding principles spelt out in recommendation 4.1; having particular regard to the likelihood that public funding will induce a reasonable 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.*

Future public funding arrangements for the RDC model

RECOMMENDATION 7.1

The basis on which the Australian Government matches levy and other eligible industry contributions to the Rural Research and Development Corporations (RDCs) should be modified as follows:

- ***The generally applicable cap on the Government's dollar for dollar matching of eligible industry contributions 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 10 years, with the cap reducing by 0.025 per cent of GVP each year during this period.***
- ***There should be a new uncapped matching contribution of 20 cents per dollar for eligible industry contributions in excess of the applicable cap on dollar for dollar matching. This new contribution should be introduced in full at the commencement of the phase-in of the lower cap on matching dollar for dollar contributions.***
- ***Contributions made to RDCs through donor company arrangements by an individual private entity (as defined in recommendation 10.3) should not be eligible for any matching government contributions.***

Future matching contribution arrangements for very small industries paying statutory levies or making voluntary contributions to the Rural Industries RDC (RIRDC) or Horticulture Australia Limited (HAL) should be determined by the Department of Agriculture, Fisheries and Forestry, following further consultation with the Council of Rural Research and Development Corporations, HAL, RIRDC and the industries involved. This consultation process and the subsidy arrangements that emerge from it, should aim to:

- ***deliver a reasonable level of resources for research activity in the industries concerned***
- ***ensure that access to these arrangements is appropriately limited in terms of both industry coverage and the duration for which special funding support is available.***

This process should also encompass future arrangements for matching voluntary contributions made to RIRDC by the Fodder and Horse industries.

RECOMMENDATION 8.1

The Australian Government should establish and fund a new Rural Research and Development Corporation (RDC), 'Rural Research Australia' (RRA).

- ***RRA's broad remit should be to invest, on behalf of the Australian Government, in non-industry specific R&D that promotes productive and sustainable resource use by Australia's rural sector.***
- ***Its precise remit should be developed through a consultative process, involving engagement by RRA's board with: the Department of Agriculture Fisheries and Forestry (DAFF) and other relevant areas of the Australian Government; the Primary Industries Standing Committee (PISC) of the Primary Industries Ministerial Council; industry RDCs; major research providers and researchers. As part of this process — which should be completed with 12 months — explicit consideration should be given to:***
  - ***bringing the 'national rural issues' R&D (and the associated funding) that is currently the responsibility of the Rural Industries RDC within the new entity***
  - ***the scope to beneficially transfer any Australian Government departmental research programs (and the associated funding) into RRA.***

  However, RRA's remit should not extend to the sector-specific, broader resource management, research undertaken by the Fisheries RDC.

  RRA's board should then seek the agreement of the Government for its proposed remit and initial research agenda; and the funding appropriation necessary to deliver that agenda.
- ***RRA should be created as a statutory R&D corporation under the Primary Industries and Energy Research and Development Act 1989 (Cwlth).***
  - ***In each of the first two years of its operations, RRA should receive seed funding from the Australian Government of $5 million to meet establishment expenses, to allow it to engage with relevant parties as part of the remit and agenda setting process, and to cover the costs of any early research contracts.***
  - ***Thereafter, its funding appropriation should be provided under a quadrennial agreement at a level which would allow it to implement the agreed agenda in a timely way and without excessive reliance on leveraging from other funding sources, including from other RDCs.***
  - ***More generally, in establishing RRA, the Government should clearly signal that the new entity is to become an integral part of the RDC arrangements and that its future funding appropriations will reflect this.***
- ***RRA should operate under the same broad governance, reporting and consultation requirements as other statutory RDCs. However, it should:***
  - ***be exempted from the designated industry body provisions***

  - *be subject to the existing rather than the proposed new general arrangements governing Ministerial involvement in priority setting and planning processes (see recommendation 9.2)*
  - *be excluded from the proposed change to allow statutory RDCs to take on marketing functions (see recommendation 9.3)*
  - *have special board composition and selection procedures: specific provision should be made to include a senior member from DAFF; an equivalently senior State and Territory Government member nominated by PISC; and either the independent chair of the Council of Rural Research and Development Corporations, or a chair of one of the industry RDCs elected by the Council. The remaining board members should be appointed by the Minister based on the advice of a selection committee chaired by the Secretary of DAFF.*
- *In giving effect to the requirement for periodic independent reviews of the performance of all RDCs (see recommendation 9.8), the reviews of RRA's performance should explicitly assess whether:*
  - *it has engaged effectively with industry RDCs*
  - *its research portfolio includes an appropriate number of collaborative projects with industry RDCs and/or other industry interests*
  - *its extension strategies have given suitable attention to drawing on the skills and producer linkages of the industry RDCs.*
- *Following the establishment of RRA, the other RDCs — except for the Fisheries RDC — should be left to focus predominantly on funding R&D of direct benefit to their levy payers, with their funding contributions from the Australian Government gradually adjusted in accordance with recommendation 7.1.*

Principles to guide the future operation of the RDC program

RECOMMENDATION 9.1

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

- *invest in a project portfolio that appropriately balances long-term and short-term, high-risk and low-risk, and strategic and adaptive research needs*
- *collaborate, as appropriate, with other relevant RDCs and research organisations in cross-sectoral research*

- *have in place suitably resourced processes to facilitate 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 relevant information on the outcomes of completed research projects in a timely manner*
- *through their processes for nominating potential directors and/or engagement with the Government on potential director appointments, facilitate boards that have a suitable balance of relevant skills and experience, rather than a balance of representative interests*
- *pursue ongoing improvements in administrative efficiency, with regard to both their own activities and those of their research partners*
- *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:

- *clearly articulate the role of the RDCs within the broader rural R&D framework*
- *engage openly and constructively with RDCs and other stakeholders*
- *discharge its administrative responsibilities in relation to the RDC program in a timely and efficient fashion*
- *verify that nominated representative bodies for each of the statutory, industry RDCs remain suitably representative of the industries concerned and are not overly dependant 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 RDC principles

RECOMMENDATION 9.2

Consistent with the overarching public funding principles for the rural R&D framework (see recommendation 4.1), 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 valuable rural R&D that would not otherwise be undertaken.

With that guidance and the RDC-specific principles (see recommendation 9.1) in place, requirements for formal Ministerial involvement in research priority setting and approving RDCs' strategic and operating plans should be removed, except for the Fisheries RDC and Rural Research Australia.

RECOMMENDATION 9.3

The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that the statutory Rural Research and Development Corporations (RDCs) — with the exception of Rural Research Australia — 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.

RECOMMENDATION 9.4

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 recommendation 12.1). In the interim, the two RDCs that already have an industry-representation role — the Australian Egg Corporation Limited and Australian Pork Limited — should be allowed to maintain that function.

RECOMMENDATION 9.5

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 significant contemporary 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 industry 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.

Government appointments to the board of Rural Research Australia should be the subject of entity-specific provisions (see recommendation 8.1).

RECOMMENDATION 9.6

The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended to make the board of each statutory Rural Research and Development Corporation responsible for electing one of its appointed directors as chairperson, and setting the term of this appointment.

RECOMMENDATION 9.7

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 continue 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).

Through the CRRDC, the RDCs should continue to explore means to increase the robustness of this evaluation process, including through a greater emphasis on revisiting past evaluations to assess whether assumptions about such things as adoption rates and additional extension-related costs have proved to be reliable.

For the time being, the program-wide evaluation process should continue to be on an annual basis. However, if based on the advice of the CRRDC and the Department of Agriculture, Fisheries and Forestry, the Minister is satisfied that the benefit–cost tradeoff is such as to justify a less-frequent timeframe, that timeframe should be adjusted accordingly.

RECOMMENDATION 9.8

The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that each statutory Rural Research and Development Corporation (RDC) is required to commission an independent performance review every three to five years. Similarly, statutory funding agreements should continue to require that each industry-owned RDC commission an independent performance review every three to five years.

- ***The precise frequency and scope of review for each RDC should be agreed with the Department of Agriculture, Fisheries and Forestry.***
- ***However, every review should explicitly examine the performance of the RDC concerned against the principles articulated in recommendation 9.1, and should also consider the scientific merit of that RDC's research portfolio.***
- ***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.***

RECOMMENDATION 9.9

The 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 recommendation 9.7) and independent performance reviews (see recommendation 9.8), and contain:

- ***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 recommendation 10.3).***

RECOMMENDATION 9.10

To motivate an under-performing Rural Research and Development Corporation (RDC) to remediate problems identified in an independent performance review (recommendation 9.8), the Department of Agriculture, Fisheries and Forestry (DAFF) should employ an escalating series of monitoring and reporting mechanisms. These should draw on the existing provisions available to DAFF, including to:

- ***require an interim follow-up performance review within 12 months***
- ***initiate a formal audit of an under-performing RDC by the Auditor-General***
- ***invoke its powers under the Primary Industries and Energy Research and Development Act 1989 (Cwlth) to direct the conduct of a statutory RDC***

- ***apply the provisions in statutory funding agreements enabling it to impose conditions on how, and for what purposes, funds can be spent by an industry-owned corporation.***

If, after a reasonable period of time, it becomes clear that non-pecuniary sanctions have not been sufficiently corrective, then the Australian Government should partially or fully withdraw its funding for the RDC concerned.

Levy arrangements

RECOMMENDATION 10.1

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

RECOMMENDATION 10.2

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 Rural Research and Development Corporation program (see recommendation 9.9), the 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.

RECOMMENDATION 10.3

Voluntary contributions to Rural Research and Development Corporations should only be eligible for matching government funding if the following conditions are satisfied.

- ***At least two non-associated entities — whether directly or through an industry body — have made a financial contribution toward the cost of the research concerned.***
- ***There are no commercial-in-confidence provisions precluding general disclosure of the outcomes of the research for any longer than is needed to apply for agreed intellectual property protection.***

FINDING 10.1

In industries where an RDC is responsible for undertaking both research and marketing functions, levy payers should be free to opt for either separate levies or a combined levy. It should also be up to levy payers to determine the scope for the boards of these RDCs to reallocate levy funding between R&D and marketing

without requiring formal approval from levy payers and what other mechanisms might be required to ensure that such reallocations are appropriate.

FINDING 10.2

It is important that the Levies Revenue Service continues to monitor its performance and the costs of collecting levies, and communicates the results of that monitoring to stakeholders via its Annual Report and other appropriate communication channels.

FINDING 10.3

There is no strong basis for extending statutory R&D levies on processors beyond their current application.

FINDING 10.4

Especially over short time periods, it would be counterproductive for RDCs to try and precisely calibrate the expected regional distribution of benefits from their project portfolios with the regional distribution of levy payments. However, over time, if RDCs' research outputs do not deliver benefits to all levy payers, ongoing support for the levy system and the RDC model could be put at risk.

Framework data collection and program coordination

RECOMMENDATION 11.1

The Department of Agriculture, Fisheries and Forestry (DAFF) should undertake a scoping study to determine how the data on funding and spending flows within the Australian rural R&D framework might be improved in a cost-effective way to better inform future policy making. In doing so, DAFF should consult with relevant stakeholders, including State and Territory Governments, the Council of Rural Research and Development Corporations, farming groups and the Australian Farm Institute. DAFF should finalise and publish this scoping study within 12 months.

RECOMMENDATION 11.2

The Australian Government should establish a subcommittee to its Coordination Committee on Innovation, focused exclusively on rural R&D. That subcommittee should be tasked with:

- ***promoting consistency in approaches across specific and more general Australian Government programs that provide funding for rural R&D***

- *liaising with other relevant entities — including the Primary Industries Standing Committee of the Primary Industries Ministerial Council — on the implications of changes in Australian Government funding programs for the totality of the rural R&D framework and on any associated cross-government or industry-government coordination issues that arise*
- *providing advice to the Australian Government on any systemic coordination issues that require remedial action.*

The subcommittee should also provide input to the development of the research remit for Rural Research Australia (see recommendation 8.1).

Further review

RECOMMENDATION 12.1

At the end of the ten-year phase-in of the proposed new government funding arrangements for industry Rural Research and Development Corporations (RDCs) — see recommendation 7.1 — there should be a further independent and public review of the RDC model. Amongst other things, that review should examine:

- *the responses of levy payers to the changed matching government contribution regime*
- *the extent to which the changes to the model, 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*
- *the impacts of the changes to the model on the adoption of research outputs by producers*
- *the case for making industry representation a generally allowable function for any RDC*
- *the arguments for and against continuing to provide matched government funding for contributions to the RDCs by processors*
- *whether the statutory levy rate review requirements have had any effects on the frequency of levy changes*
- *the implications of changes in the wider rural R&D framework for future RDC arrangements.*

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 enhance the productivity and competitiveness of primary producers. Indeed, the benefits from rural R&D (box 1.1) typically 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 is for the 15 Rural Research and Development Corporations (RDCs), which commission R&D on behalf of primary producers and the Government. 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)

'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'.

Although levy arrangements have existed in different industries since as early 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 needs of industry have evolved, there have been various alterations to the specifics of the model. The broader policy focus for rural R&D has also 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. This too has had implications for the operation of the RDC arrangements.

As submissions to this inquiry demonstrate, there is very 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 general concern is the degree to which public funding support complements private R&D investment by addressing unmet broader rural research needs, rather than simply subsidising R&D that primary producers would otherwise have had sound financial reasons to fund themselves. 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.

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

Nonetheless, industries' interests cannot be considered in isolation from the interests of others in society. 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.

Avoiding duplication with other inquiries

As outlined in chapter 2, the RDC arrangements sit within a complex broader framework for funding, managing and delivering rural R&D. In determining the extent to which it should delve into the broader framework as part of an inquiry focused principally 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 potential payoffs from addressing some widely acknowledged deficiencies in the broader framework may well be higher than from making improvements to what is clearly one of the better performing components of that framework. Reflecting these sorts of issues, various participants (for example, the National Farmers Federation, sub. DR230) encouraged the Commission to interpret its terms of reference very broadly.

On the other hand, several parallel reviews and processes constrain how far this inquiry could reasonably extend into broader framework issues without risking considerable duplication of effort.

- The Rural Research and Development Council — a body created in 2009 to

advise the Australian Government on rural research matters — released a draft investment plan for the entire rural R&D sector in January 2011 (Rural Research and Development Council 2011).

- The Australian Government, through the R&D subcommittee of the Primary Industries Standing Committee, is working with the State and Territory Governments and other key stakeholders 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 established 'expert working groups', which have released reports on food security and the nexus between energy, carbon and water (PMSEIC 2010a, 2010b).
- In the context of concerns about food security (chapter 3), the Australian Bureau of Agricultural and Resource Economics and Sciences and the Rural Industries RDC are to conduct a study into the history of foreign investment in Australian agriculture. Related to this, the 2011 agricultural census by the Australian Bureau of Statistics will provide a contemporary snapshot of foreign ownership levels of Australian farming land (Shorten and Ludwig 2010).

Also, a sizeable part of government funding for rural R&D comes through programs that are not specific to the rural sector, and which therefore could 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:

- setting out some generally applicable public funding principles
- addressing the questions in the terms of reference about total funding for rural R&D and the share of that funding that should be met by government
- exploring a small number of specific framework issues that have a direct bearing on the efficacy of the current RDC model and of potential means to improve it.

As discussed in chapter 4, the Commission sees the proposed public funding principles as being especially important for facilitating effective and consistent evaluation of individual funding programs — including the RDC model. Even if a particular funding program were considered in isolation, any changes necessary to promote compliance with such principles are likely to be much the same as the changes that would emerge were that same program to be assessed as part of a framework-wide review.

Analysis informed by evidence

In forming its views on the efficacy of the RDC arrangements, and in its consideration of related broader framework issues, the Commission has drawn on both quantitative and qualitative evidence.

However, the quantitative data available are subject to significant limitations:

- There are major gaps in the data on how much money is currently being invested in rural R&D.
- Various methodological and data issues mean that the results of project-specific evaluations, as well as studies on the aggregate impact of past rural R&D investments, need to be interpreted with caution. Moreover, as explained in chapter 4, the latter studies provide relatively little guidance on what policy changes might be made to deliver better outcomes in the future.

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.

Broad-ranging consultation with stakeholders

In preparing this 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 produced an issues paper in March 2010, to which interested individuals and organisations responded with 163 submissions. Following the release of a draft report in September 2010, a further 132 submissions were received.

The Commission also:

- held public hearings in Sydney, Canberra, Melbourne, Tamworth, Brisbane, Hobart, Adelaide, Perth and Mildura to receive feedback on the analysis and findings in the draft report

- consulted extensively with participants on a more informal basis. In addition to discussions with all 15 RDCs, meetings were held with a broad cross-section of groups including producers, industry representative bodies, cooperative research centres, universities, private researchers, and various Australian Government and State and Territory Government departments and agencies
- met with a number of parties in New Zealand, to discuss whether any different approaches for funding, managing and delivering rural R&D in that country might be applicable in Australia.

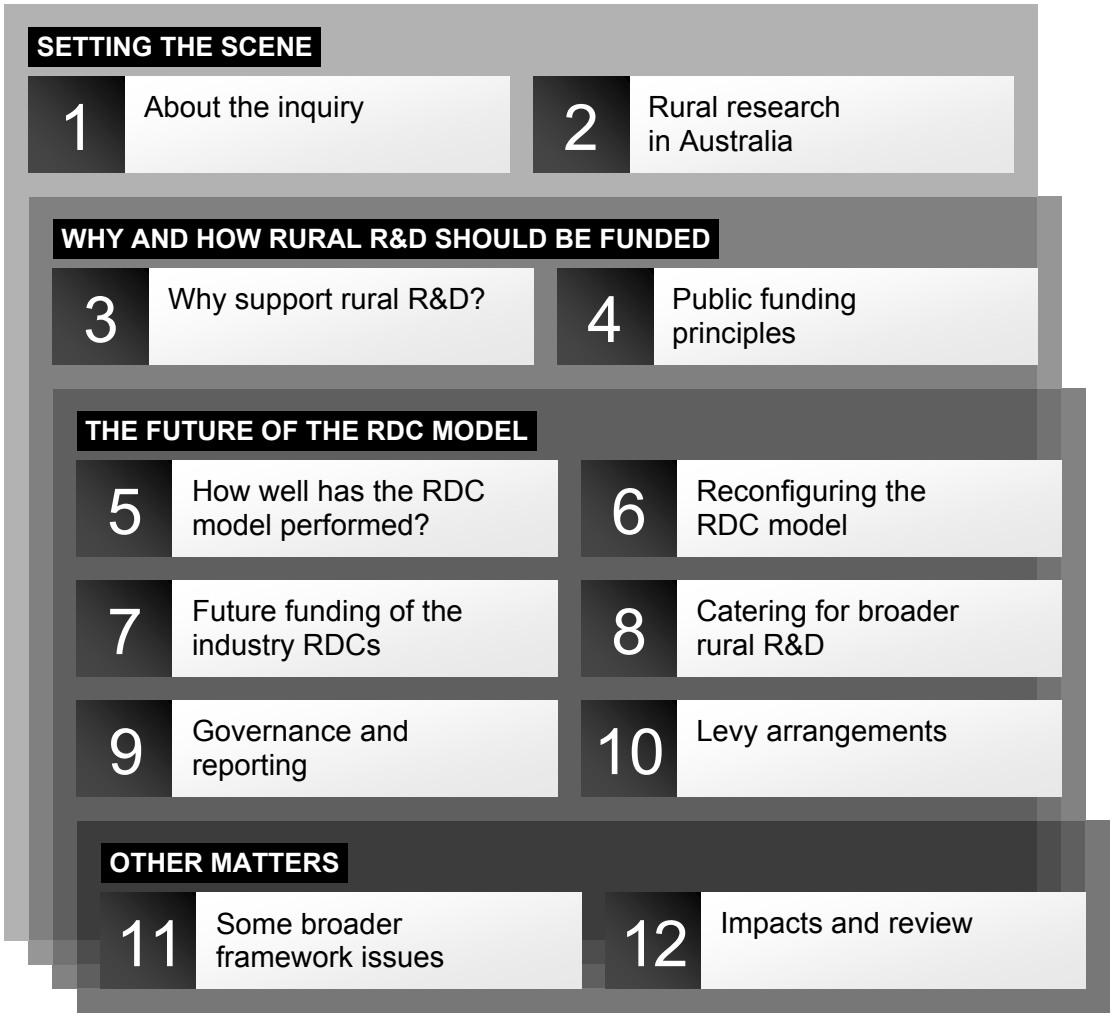
The Commission is grateful to all who have taken the time to contribute to the inquiry. As can be observed throughout this report, public input has helped considerably to inform the Commission's analysis and findings. A list of all individuals, agencies and organisations that provided written submissions, or with whom the Commission met over the course of the inquiry, is included in appendix A.

1.3 A 'road map' for the report

Figure 1.1 illustrates the structure of the 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 various rationales for government to contribute to the cost of that research.
- Chapter 4 specifies some high-level, generally applicable public funding principles, on which the Commission has based its subsequent assessments of the RDC arrangements. Drawing on these principles, the chapter also addresses the questions in the terms of reference relating to how much in total Australia should be investing in rural R&D and how the cost should be shared between public and private parties.
- The subsequent suite of chapters analyse the current RDC model and how it might be improved.
  - Chapter 5 considers how well the RDC model has performed, and identifies the main factors bearing upon its suitability in the future.
  - Chapter 6 sets out why a modified RDC model should be retained, and the nature of the key changes required to achieve better 'value for money' from the Australian Government's contribution to the model.
  - Chapter 7 details the Commission's specific recommendations on the future level and configuration of public funding support for industry-focused R&D sponsored through the model.

Figure 1.1 **What the report covers**



  - Chapter 8 outlines how broader rural research needs could be more effectively addressed within the model.
  - Chapter 9 discusses supporting changes to the more detailed architecture of the model, with an emphasis on future governance arrangements.
  - Chapter 10 identifies a small number of enhancements to the industry levy system that underpins the RDC model.
- Chapter 11 looks at some other matters that have been germane to the Commission's assessment of the model, including framework-wide data deficiencies and shortcomings in the coordination of government programs.
- Chapter 12 draws together the report's various recommendations, and discusses how the proposed reform package would benefit the community as a whole. It also outlines the basis for a further review of the RDC arrangements.

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, the Commission estimates that governments 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 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 most of 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 invested approximately $490 million in rural R&D, representing over 30 per cent of the estimated total available rural R&D funding in that year.
- The RDC model is internationally unique, and is highly regarded both in Australia and overseas.

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

R&D is a major component of the wider innovation system within the rural sector (box 2.1). The broad framework for planning, funding and delivering rural R&D

Box 2.1 **The rural innovation system**

'Innovation' can be thought of as any process that adds value by 'generating or recognising potentially beneficial knowledge and using such knowledge to improve products, services, processes or organisational forms' (PC 2007, p. 7).

Many factors can promote innovation in the rural sector, including:

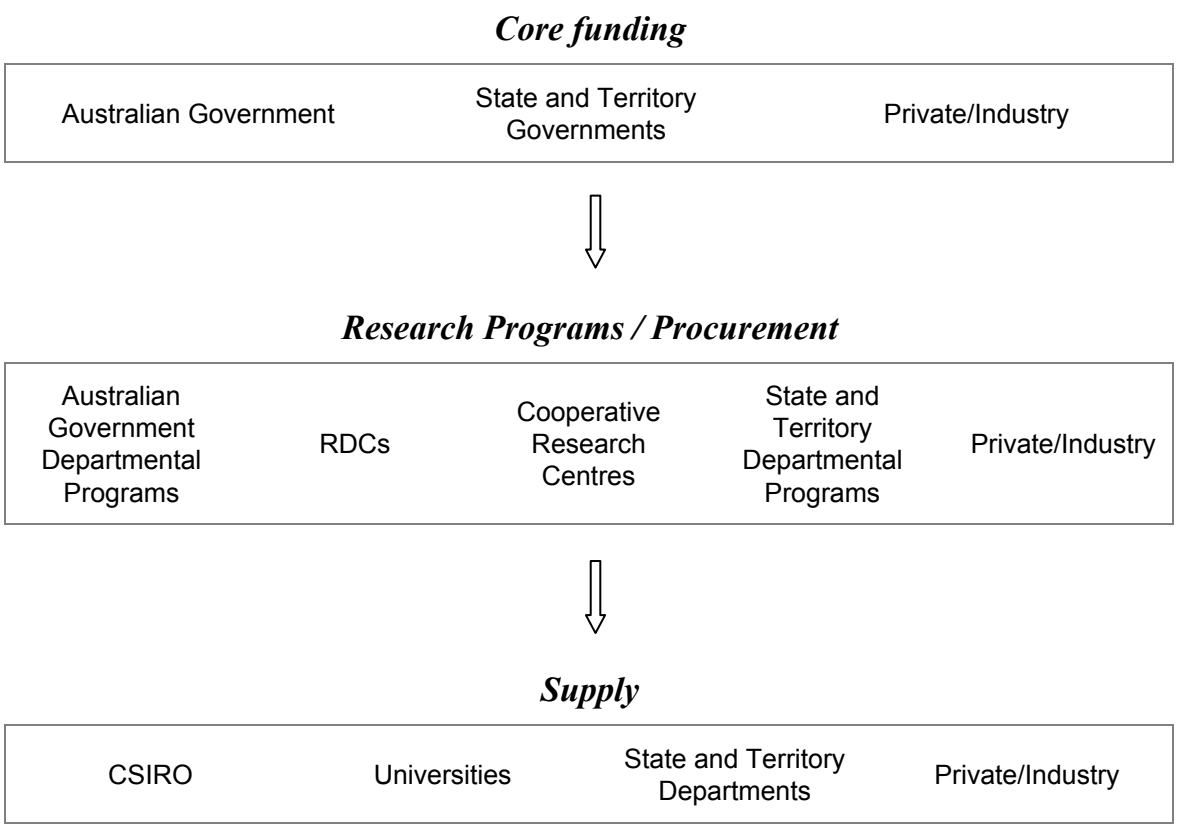
- Effective access to the existing body of scientific knowledge.
- New R&D focused on the rural sector and undertaken in either Australia or overseas.
- Non-rural R&D embodied in inputs used by primary producers, again undertaken either domestically or in other countries.
- Access to a well trained workforce. In this regard, the role of education and training systems are twofold. As well as providing the foundation research staff and expertise in the adoption of new technological developments (so called extension), education may improve producers' appreciation of, and ability to evaluate, the benefits of innovation.
- Access to appropriate scientific infrastructure, such as laboratories and research stations.
- A facilitative policy and market environment. For example, R&D tax incentives and schemes that help make capital more accessible are designed to increase funding for innovation. Strong intellectual property regimes enhance innovation incentives by enabling appropriation of the returns from new processes and products. More broadly, trade liberalisation policies encourage innovation by exposing producers to potentially more efficient foreign competitors.

Social and cultural factors can also be important in developing innovations. In particular, within a given region or industry, a culture of innovation and strong social links between producers can promote both the generation and testing of new ideas.

While the focus of this inquiry is on investment in R&D via the RDC model, as the preceding listing illustrates, it is far from the only factor affecting innovation in the rural sector. Indeed, as explained later in the report, many of these other factors have a bearing on the efficacy of the model and on what changes might be made to improve it.

is itself 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).

Figure 2.1 **Rural R&D funding and delivery framework**



Estimates of total funding and expenditure

The lack of a systematic data base for rural R&D funding means that estimates have been either proxied by expenditure data, or pieced together from a range of different sources.

The expenditure measures compiled by the ABS (*Research and Experimental Development*, Cat. 8112.0) are problematic because of the potential for double

counting. Furthermore, as expenditure measures they provide no information on the source of funds.

Because of the lack of robust funding data, the Commission prepared its own estimates of rural R&D funding (table 2.1).[1] In doing so, it liaised directly with State and Territory Governments and various Australian Government Departments. These estimates suggest that in 2008-09:

- total funding was in the order of $1.5 billion (equivalent to about 3.3 per cent of the gross value of production (GVP) for the agriculture, fisheries and forestry sector in that year)
- the government share of this total funding was approximately 75 per cent
- the Australian Government contributed around two thirds of total government funding.

The Commission emphasises that these estimates do not constitute the last word on the total amount of funding available for rural R&D.

- Funding for extension from private parties is unlikely to be picked up in the tax concession data — though given that much of the private funding for rural R&D outside of the RDC model comes from large corporations conducting research in-house, the amount of 'missing' funding involved is likely to be modest.
- Funding from State and Territory Government environment departments and their equivalents is not included in the Commission's estimates. Extrapolating from data supplied to the Commission by the Queensland Department of Employment, Economic Development and Innovation, inclusion of such funding could add around $50 million to the total funding estimate in table 2.1.
- While the Commission considers that its definition of rural research is appropriate in the context of the RDC model (see box 2.2), it recognises that this definition may not necessarily be suitable for some other purposes — such as making international comparisons.

Equally, there are some significant issues with some alternative estimates that are currently in the public domain.

- The Australian Farm Institute (AFI) (Keogh and Potard 2011, and synthesised in sub. DR286) have compiled alternative funding measures which, amongst other things, portray the private sector as providing a considerably higher share of total funding than the Commission's estimates. However, some missing data and questionable methodologies compromise the reliability of these estimates (see box 2.2).

[1] These data have modified slightly since the release of the draft report, in response to both input from some participants and the Commission's own further analysis.

- Estimates reported by the Rural R&D Council (2011) and John Mullen (sub. DR172) draw heavily on ABS expenditure data, and are therefore problematic for the reasons outlined above. The Commission also notes that the Council's 'headline' funding estimate of $2.9 billion a year includes, amongst other things, research into environmental management, and hence incorporates a large amount of expenditure that is unrelated to rural production.[2]

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

Organisation type	*Funding*	*Share*
	million	%
Australian Government[b]		
Cooperative Research Centres	63	
Core funding for the CSIRO	193	
Core funding for the universities[c]	118	
Research and Development Corporations (RDCs)	218	
Other departmental programs[d]	114	
Foregone tax receipts arising from R&D tax concessions	9	
Total Australian Government	*715*	*48*
State and Territory Governments		
Project-related budget allocations[e]	348	
Capital investment in R&D facilities	47	
Payments to other funders and suppliers	21	
Total State and Territory Governments	*416*	*28*
Private/Industry		
Levy payments provided to RDCs	248	
Other (for which a tax concession is claimed)[f]	116	
Total Private/Industry	*364*	*24*
Total	**1495**	**100**

a These data have been updated since the draft report. They do not include funding from royalties and other intellectual property income (on the basis that these have been generated by past funding from governments and private parties). Also, the data do not include in-kind contributions from the private sector, such as through the provision of land and facilities for experiments. **b** Only the portion of the budget assigned to rural R&D is included. **c** 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. **d** Includes programs aimed at wider issues (such as climate change), programs with no sector-specific focus and any one-off payments. **e** Includes rural R&D and associated extension funding for programs facilitated within the primary industry department (or its equivalent). Any funding for rural R&D from State and Territory Government environment departments and the like is not included. **f** Calculated using tax concession data (including an estimate for concessions claimed for R&D on agricultural chemicals). Also includes payments made to the Australian Animal Health Laboratory.
Source: Productivity Commission estimates.

2 The council's estimate of expenditure for the agricultural, fisheries and forestry sector of $1.1 billion is derived from the ABS expenditure series for the plant production and primary products and animal production and primary products socio-economic objectives. It therefore excludes a variety of spending on research activities that are directly relevant to the rural sector such as agricultural chemicals, fertilisers and pesticides.

Box 2.2 **Australian Farm Institute estimates**

The most significant commentary on the estimates of rural R&D funding provided in the draft report was from the AFI (sub. DR286; trans., pp. 19–43), which mainly raised concerns about the definition of rural R&D that the Commission had employed. The AFI pointed out that this definition was inconsistent with that used by the OECD — and that in keeping with OECD conventions, R&D investments made through environment departments and extension expenditure should be excluded from estimates of Australian rural R&D funding.

The AFI put forward some alternative measures (Keogh and Potard 2011) based on OECD definitions and incorporating an estimate of total private funding for rural R&D extrapolated from the results of a 2010 survey of rural corporations. Relative to the Commission's estimates, these data indicate that in 2008-09:

- total rural R&D funding was lower at $1.2 billion
- the government share of total rural R&D funding was also lower at about 65 per cent
- the Australian Government's share of this government funding was approximately the same at about two thirds.

However, the Commission considers that there are some significant problems with the AFI's estimates, especially in the context of an inquiry into the RDCs.

- Its estimate of Australian Government funding comes from the Science and Innovation Budget Tables, which record R&D expenditure against socio-economic objectives. However, because objectives are defined at the program level, some funding for rural R&D from wider programs such as the various climate change schemes and Commercial Ready are not included. By contacting Australian Government departments and program managers directly, the Commission was able to estimate how much of each program's budget was used for R&D related specifically to rural production. In the Commission's view, this approach of classifying R&D according to the *nature* of the research, rather than the broad *objective*, is more appropriate — especially for providing context to the activities of the RDCs. In particular, the RDCs do not only fund R&D aimed at improving rural production systems. Rather, in return for their government contribution, the RDCs are expected to fund some research that has broader objectives, such as improving social and environmental outcomes (see chapter 5).
- Extension expenditure, which has been mainly excluded from the AFI estimate (in keeping with OECD definitions), is part and parcel of most R&D investments. It is also often very difficult to delineate statistically. Indeed, the AFI's estimate of private investment includes producer contributions to RDCs — some of which are used for extension. As such, in excluding money for extension from its government funding data, the AFI has seemingly biased upward the private sector share of total funding.

(Continued next page)

Box 2.2 (continued)

- In using its survey of rural corporations to derive an estimate of total private rural R&D funding, the AFI prorated the R&D expenditure intensities for the surveyed enterprises over the remaining value of production in their respective sectors. The AFI noted that applying the R&D intensity ratios from a sample of large, corporate businesses to the rest of a particular sector (which would mainly consist of small operators), is likely to result in an over-estimate of funding. In contrast, the Commission derived an estimate of private funding for rural R&D from Government payments made under the R&D tax concession scheme. In this regard, it was able to source data on payments to agricultural chemical and fertiliser companies to include in this estimate.
- In the case of non-contract university funding, like the Commission, the AFI allocated a portion of the total infrastructure block grants paid to universities in 2008-09 as funding from the Australian Government for rural research. However, the AFI's apportioning was based solely on the share of agricultural students in the total student population (1.5 per cent). In fact, the actual measures used to determine infrastructure block grants are the portion of students completing higher degrees by research and the share of contestable research funding with an agricultural focus. Applying this methodology to the three largest infrastructure grants gives a weight to agriculture of between 10 and 12 per cent, which the Commission has used in its estimates.

Accordingly, the Commission did not make major adjustments to its estimates based on the AFI's contentions.

More importantly, the existence of such differences is in many respects beside the point. The take-home message is that current funding data in this area are deficient and should desirably be improved (see chapter 11). Pending such an exercise, the Commission has not sought to fully resolve the data issues noted above and in box 2.2. Indeed, as discussed later in the report, while access to better funding data would help to improve aspects of policy making, it would not provide ready-made answers to questions such as how governments should be contributing to particular policy programs.

Funders of rural R&D in Australia

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 2.3).

Box 2.3 **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.

National Research Priority	Corresponding Rural R&D Priorities
Promoting and Maintaining Good Health	*Productivity and Adding Value* Improve the productivity and profitability of existing industries and support the development of new ones *Supply Chain and Markets* 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
An Environmentally Sustainable Australia	*Natural Resource Management* Support effective management of Australia's natural resources to ensure primary industries are both economically and environmentally sustainable *Climate Variability and Climate Change* Build resilience to climate variability and adapt to and mitigate the effects of climate change
Safeguarding Australia	*Biosecurity* Protect Australia's community, primary industries and environment from biosecurity threats

Source: DAFF (2007).

- The largest of these 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, and in some cases processors, via statutory levies or voluntary contributions (often levy-based), 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 develop and undertake R&D in specific areas, with a particular emphasis on applied R&D. CRCs must include a university and an end user, with an RDC, CSIRO, industry representative or government organisation being amongst the other possible partners. 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 2.4).

Box 2.4 **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, 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).

- As alluded to in the discussion of funding data, the Australian Government also provides support for 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 2.5.

Box 2.5 **Australian Government programs providing funding for rural R&D[a]**

Portfolio	Program
Agriculture, Fisheries and Forestry[b]	Australian Pest Animal Research Caring for our Country Climate Change Research Fisheries Resources Research Fund Forest Industries Climate Change Research Fund Regional Food Producers Innovation and Productivity Research and Development Corporations
Climate Change and Energy Efficiency	Australian Climate Change Science Bilateral Climate Change Partnerships Greenhouse Action in Regional Australia
Innovation, Industry, Science and Research	ARC grants Climate Ready[c] 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[d]
Sustainability, Environment, Water, Population and Communities	National Environmental Research[e] Sustainable Rural Water Use and Infrastructure Water Resource Assessment and Research Grants

[a] The Department of Foreign Affairs and Trade also provides funding to Australian entities to perform R&D related to Australian aid programs. Some programs are collaborative initiatives which attract investment from sources other than the Australian Government. [b] Two other programs that until very recently were funded through the Agriculture, Fisheries and Forestry portfolio were the Advancing Agricultural Industries program and National Resource Innovation Grants. [c] Closed for applications. [d] The Education, Employment and Workplace Relations portfolio also funds universities via schemes that support capital development and education provision in higher education institutions. [e] Previously the Commonwealth Environment Research Facilities.

State and Territory Governments

The significance of State and Territory Government funding for rural R&D appears to have been somewhat overstated. One reason for this is that funding and expenditure seem to have been conflated, meaning that investment that has come from 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 experiment 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.

As discussed in chapter 4, 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 (see South Australian Farmers, sub. DR199) — motivated by both budgetary pressures and a perception that private parties should be shouldering more responsibility for funding extension activity.

While the Commission does not have evidence that all States and Territories have reduced their total funding support, equally it has not seen any evidence that refutes this common perception. That said, the conflation of funding and expenditure data complicates assessment of trends in overall State and Territory Government funding for rural R&D. Indeed, it seems that typically perceptions in this area have been based on declines in State and Territory Government expenditure on rural R&D (see Mullen 2010; Across Agriculture, sub. 116). As discussed earlier, expenditure and funding at the State and Territory level will not necessarily have been the same.

Private funders

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

- Industry payments to 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, the Commission's estimates suggest that collectively private entities fund around 25 per cent of overall rural R&D — though it is important to recognise that the share of private funding varies considerably across industry sectors. For example, in the sugar industry, private parties have provided the

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

The recent survey by the AFI indicates that most of the research sponsored by private entities is at the more applied end of the R&D spectrum (Keogh and Potard 2011, p. 35).

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 experiment stations and extension services close to local producers. Partly because of the large capital cost of refurbishing outdated infrastructure, this network has 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).

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. In the past 20 years, through increased partnerships with the RDCs and CRCs, universities have conducted 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 4, this may allow those entities procuring R&D from the universities to shift costs back to the Australian Government.

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. As an in-house activity, relatively little information is available on the total amount of research conducted on this basis in Australia, with estimates relying on either the use of tax concession data, or firm surveys (see above).

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, in recent years the funding and delivery of extension has changed considerably.

- In response to reduced direct provision of extension services by some State and Territory Governments, there has been an increase in the number of private agronomists providing these services.
- 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 5).
- 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. 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.

- 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. 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 (PIMC) and Primary Industries Standing Committee R&D subcommittee,[3] 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.)

3 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 the Australian Government, State and Territory Governments, CSIRO, GRDC, Rural Industries RDC and the Australian Council of Deans of Agriculture.

PIMC has already endorsed 14 of the 21 industry and cross-industry strategies, with the remainder expected to be submitted to the Ministerial Council for approval by early 2012.

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 funding for, and spending on, rural R&D. Rather, it is to spend existing funds more effectively — though 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 has been developing a National Rural R&D Investment Plan — focusing on the wider rural R&D framework and its interaction with other areas of government R&D investment. A draft of that plan was released for public comment in January 2011. 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. While 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), most of these early regimes, such as the Pastoral Research Trust and Wheatgrowers' Soil Fertility Research Fund, were funded by voluntary contributions from producers. As such they were subject to various 'free-rider' problems (chapter 3).

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 2.6) 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.

Box 2.6 **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 sponsoring industry-focused rural R&D, creating the precursor to the current RDC arrangements. 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).

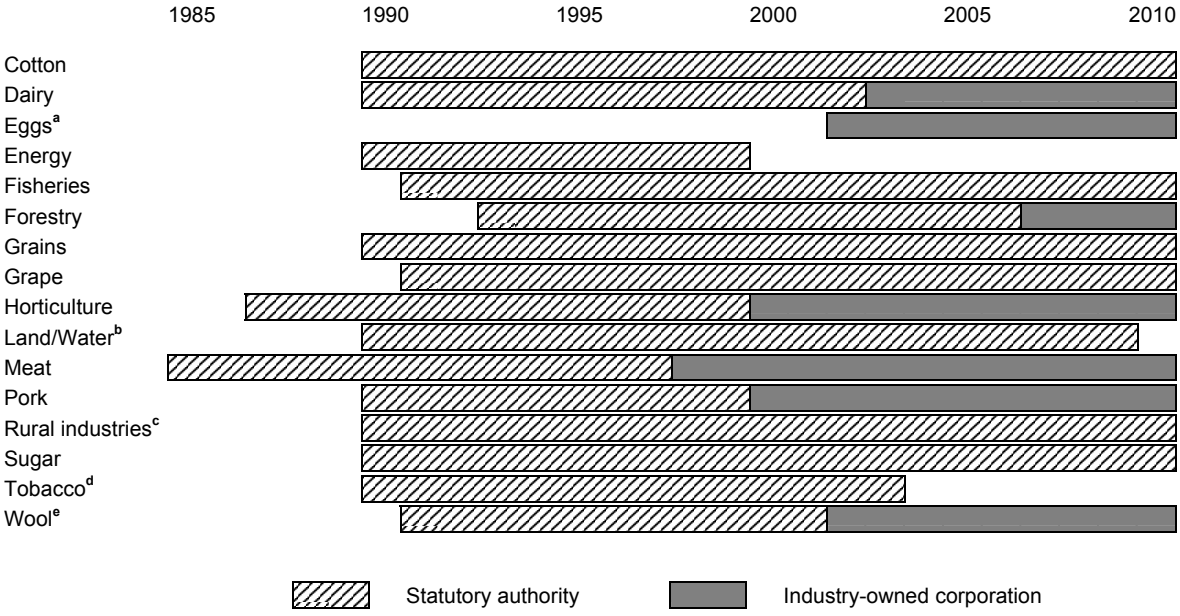
To help address these concerns, the *Primary Industries and Energy Research and Development Act 1989* (Cwlth) (the PIERD Act) established the current statutory model for the RDCs. This saw the replacement of the industry research councils with the RDCs, while maintaining the previous funding arrangements. (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**



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

The arrangements governing the operations of the RDCs have also changed significantly. A number of these changes reflect the characteristics of the particular industries concerned, including agri-political factors. But 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), resulting in variation in the legislative underpinnings of the RDCs (box 2.7). 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.

Box 2.7 **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 levies, other eligible industry contributions and matching government 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, though often very broad, industry sectors — such as fisheries, grains and horticulture. The exception is the Rural Industries RDC (RIRDC), which covers a variety of diverse, generally smaller industries, as well as sponsoring research on national rural issues. To varying extents, the other RDCs also invest in R&D in areas with relevance beyond their immediate industry 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 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)

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 Australian and State and Territory 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 instance importers),[4] and voluntary payments.

Most of the RDCs receive all of their industry funding via statutory levies. 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. (More details on the levy arrangements, including the generally lengthy procedures for introducing or changing a levy, are provided in chapter 10.)

Voluntary contributions are mainly collected by the Fisheries RDC (FRDC), RIRDC, Horticulture Australia Limited (HAL) and Meat and Livestock Australia (MLA).

- The FRDC receives the bulk of its industry funding via voluntary contributions from Commonwealth and State and Territory fisheries management agencies. These funds are matched by the Government up to 0.25 per cent of industry GVP.
- RIRDC also receives most of its industry contributions in the form of voluntary payments. RIRDC matches voluntary levies and contributions out of its annual government appropriation (see box 2.8).

4 Processors pay levies to the Australian Meat Processor Corporation, Forest and Wood Products Australia and the Grape and Wine Research and Development Corporation, while importers of forest products pay a levy to Forest and Wood Products Australia.

Box 2.8 **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 the sustainable use of fisheries resources.

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. As alluded to in the text, RIRDC uses the bulk 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.

- HAL receives approximately half of its industry funding as voluntary contributions. These contributions are matched by the Australian Government in the same way as statutory levies.
- MLA has a donor company arrangement whereby approved donors can contribute funds. These funds are eligible for matching by the Australian Government provided they fall within MLA's matching contribution cap.

While most voluntary payments eligible for the matching government contribution are provided on a collective basis for funding projects of general relevance to the industry concerned, some of these payments come from individual entities for funding projects specific to those entities (see chapter 10).

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, wool and fisheries industries, as well as some smaller industries within the RIRDC umbrella, levy payments exceed the contribution cap.

The Australian Government's matching contribution

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.[5] Additionally, the FRDC and RIRDC receive unmatched contributions from the Government for funding research of national significance (box 2.8).

The IOCs receive industry levies and matching contributions via a Statutory Funding Agreement (SFA) with the Government (box 2.9). 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).

Box 2.9 **Statutory Funding Agreements**

SFAs support the relevant pieces of industry legislation that allow IOCs to receive 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 (see text)
- 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).

5 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.

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 9). The PIERD Act requires that statutory RDC board members, including the Chairperson, be appointed by the Minister for Agriculture, Fisheries and Forestry. In contrast, IOC directors are elected by their company's members[6] and in turn elect the Chairperson in keeping with corporations law. In both cases the Managing Director or CEO is appointed by the board.

While there was previously a requirement that a designated 'government director' — often a public servant — sit on the board of the statutory RDCs, this requirement was removed in 2006 following the Uhrig review into the corporate governance of statutory authorities. However, a government representative sometimes attends the board meetings of some RDCs as an observer.

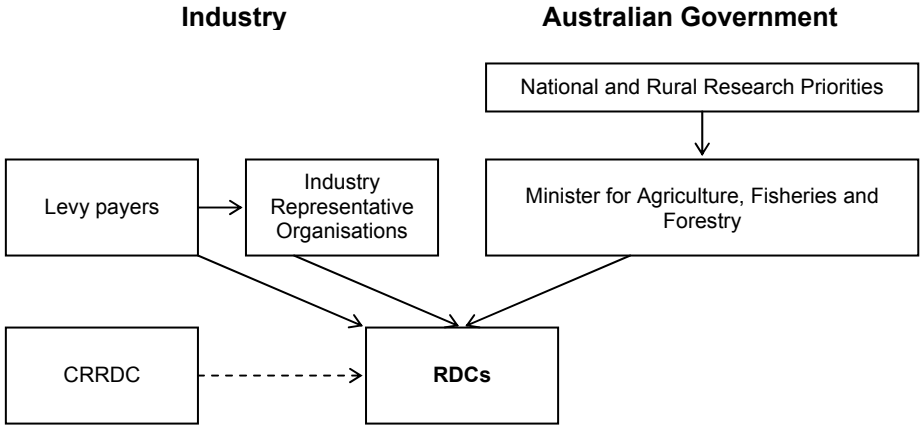
Priority setting

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 the Australian Government's 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.

6 IOC levy payers can generally opt to become members of their particular RDC. Horticulture Australia Limited is the only IOC without producer members. Instead, the peak industry bodies constitute the membership.

Figure 2.3 **RDC priority setting framework**



The Australian Government's main guidance in regard to RDCs' research focus comes via the national and rural research priorities (box 2.3). 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 the Government's priorities — though views differ on how useful these meetings have been in practice.

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. Communication and feedback is facilitated via state conferences, newsletters and surveys. Some RDCs have established dedicated regional forums to elicit stakeholder input (chapter 5), and others are required to conduct regular industry polls to determine levy rates (chapter 10).

While the emphasis of consultation is mainly on primary producers and their representatives, some RDCs — especially those who receive levies from processors — also elicit feedback from other parts of the value chain.

Reporting and Evaluation

Although 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 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. The annual reports, compliance reports and SFAs of Dairy Australia and LiveCorp 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 program, and its underlying evaluation framework, seeks to quantify or otherwise indicate the impact of past RDC investments by analysing a sample of projects each year (see chapter 9).

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 investments by the RDCs involve some financial or in-kind contribution from other parties, including other RDCs (table 2.2).

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

RDC	*Collaborative investments*	*Non-collaborative investments*
	%	%
Australian Egg Corporation Limited	56	44
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
LiveCorp	100	0
Meat and Livestock Australia	51	49
Rural Industries RDC	98	2
Sugar RDC	98	2
Weighted average	**80**	**20**

Source: CRRDC, sub. 128.

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 5).
- 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).

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 HAL 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. (For example, data supplied by Cotton Australia indicate that while the Cotton RDC accounts for around 20 per cent of total R&D funding in the cotton industry, through funding partnerships it is involved in about 60 per cent of all R&D projects carried out.) That said, concerns remain about the extent and focus of the RDCs' collaborative activities (see chapter 5).

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. Some other RDCs without a formal representative role likewise fulfil some representative-type functions on behalf of industry. This is an inevitable consequence of their strategic involvement in R&D and, in the case of IOCs, marketing.

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.

As well, some RDCs invest in education. For example:

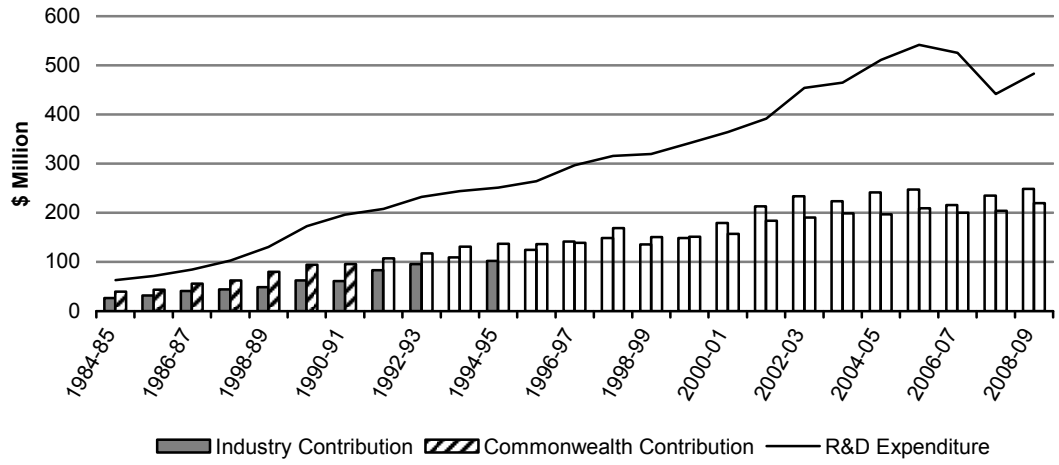
- Most of the RDCs directly fund scholarship programs.
- Dairy Australia jointly funds the National Centre for Dairy Education Australia.
- The Cotton RDC indirectly invests in education via its funding for the Cotton Catchment Communities CRC.
- Some of the RDCs fund rural R&D-related conferences and 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).

Figure 2.4 **RDC contributions and estimated R&D expenditure[a]**



[a] Includes expenditure on associated extension activities.

Source: Productivity Commission estimates, based on RDC annual reports and information from DAFF.

Expenditure levels vary considerably across the individual RDCs (table 2.3). The two largest RDCs (GRDC and HAL) accounted for more than 40 per cent of R&D expenditure across the program as a whole in 2008-09. At the other end of the spectrum, LiveCorp 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.

Research focus

While the RDCs have (to varying extents) funded some fundamental-type research, consistent with the overall pattern of rural R&D in Australia, their focus has mainly been on adaptive research.

In keeping with the original intent of the RDC model (see Kerin and Cook 1989) there has also been a heavy emphasis on projects aimed at promoting productivity in

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

	Industry contribution[a]	*Government contribution*[b]	*R&D Expenditure*[c]	*Marketing Expenditure*[d]
	$m	$m	$m	$m
Statutory authorities				
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	
Subtotal	*122.6*	*108.9*	*248.4*	
Industry-owned corporations				
Australian Egg Corporation Ltd	1.1	0.9	2.0	2.8
Australian Meat Processor Corp.[e]	12.5	0.0	7.6	7.0
Australian Pork Ltd	3.1	2.8	5.5	10.5
Australian Wool Innovation	22.6[f]	11.4	38.2	19.7
Dairy Australia	14.5[f]	19.2	33.7	5.7
Forest and Wood Products Aust.	3.6[f]	3.7	7.7	3.4
Horticulture Australia Ltd	40.9	39.8	83.2	14.7
LiveCorp[e]	0.8	0.0	0.8	3.3
Meat and Livestock Australia[e]	25.9	31.4	61.1	73.2
Subtotal	*125.0*	*109.2*	*239.8*	*140.3*
Total	**247.6**	**218.1**	**488.2**	**140.3**

[a] Includes statutory levies and voluntary contributions for R&D only. [b] Some RDCs also received a small amount of unmatched funding from other Australian Government programs. Also excluded is the indirect government support that is provided when charges for research performed for the RDCs by public sector bodies such as universities and State and Territory Government departments do not provide for the recovery of overheads incurred in the delivery of the research concerned. [c] Includes an allocation for overheads (though not necessarily on the same basis across individual RDCs), and spending on 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. [d] Includes an allocation for overheads. [e] Australian Meat Processor Corporation and LiveCorp 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. [f] 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.

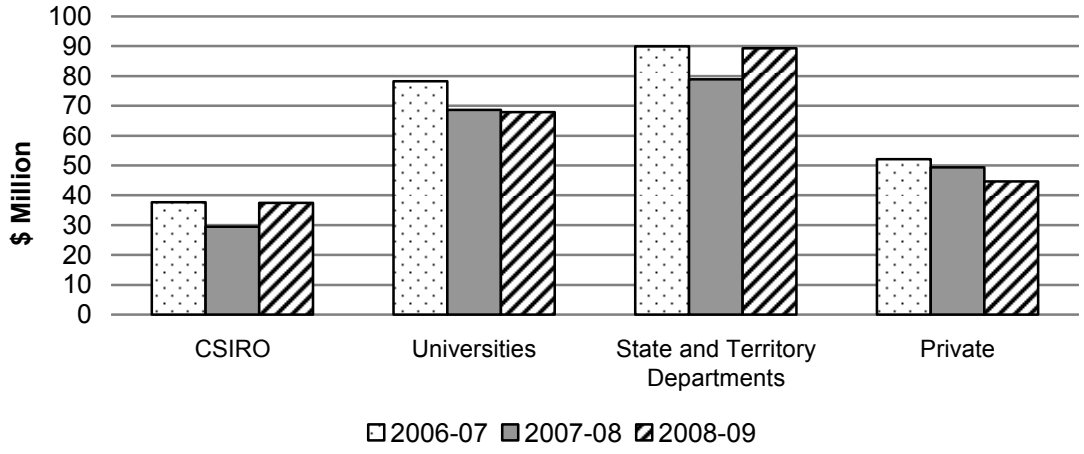
the industries concerned — recognising that such R&D sometimes has wider environmental and social benefits. More recently, however, the Australian Government has urged the RDCs to give greater emphasis to R&D which addresses cross-sectoral and broader issues. As discussed later in the report, views differ 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) indicated it is looking at coordinating such efforts across the program as a whole). 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.

Figure 2.5 **Distribution of RDC expenditure across RD&E suppliers**



a Excludes expenditure with universities that was first directed to a CRC.

Source: Information provided by the 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 (Cotton Australia, sub. 68; Ricegrowers Association of Australia, sub. 24).

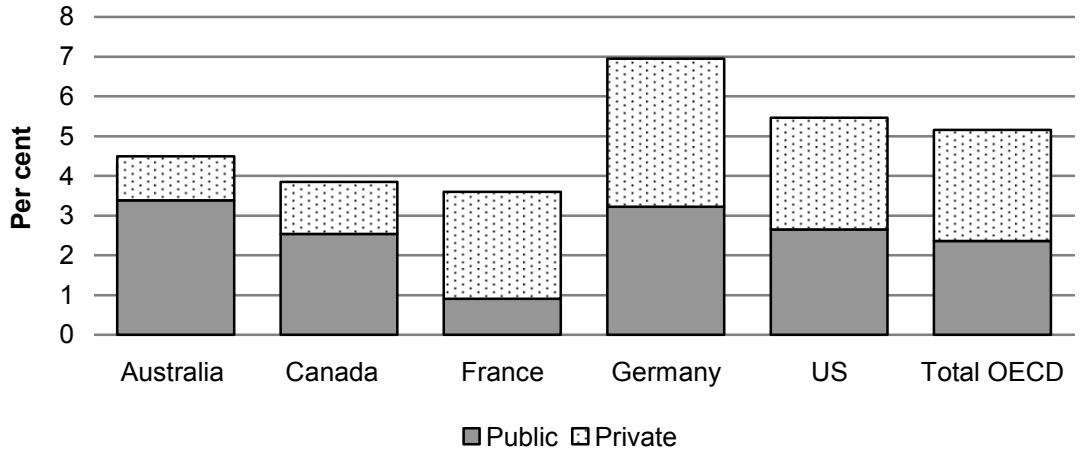
Research intensity

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 Economics 2009; OECD 2009) — though these do not appear to 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 Economics 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).

Figure 2.6 **Agricultural research intensities in selected countries**



Source: Alston et al. (2010).

These estimates must, however, 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. Furthermore, there are also likely to be differences in what range of activities is encompassed in individual country data.

For example, on the one hand, as noted by the Sugar RDC (sub. DR236), figures for some overseas countries, including the United States, are unlikely to include extension expenditure. Conversely, as noted by the AFI (trans., p. 24) it appears that expenditure on R&D in the processing sector is included in some of the overseas data but not in the Australian data. Nonetheless, at a very broad level, these data do not suggest that Australia's spending on rural R&D is widely out of kilter with international norms, especially as countries such as the United States spend considerably more on core strategic research.

Public and private funding shares

The available data also suggest that, 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, the Alston data suggest that 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. Similarly, in its discussions in 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.

Again, considerable caution is required in regard to such comparisons.

- Differences in the activities encompassed by the data may have a bearing on the relative public and private funding shares. For instance, as the AFI observed, insofar as research in the food processing sector is predominantly funded by the private sector, its inclusion in the data will, other things equal, reduce the apparent public funding share. Similarly, for the sorts of reasons discussed earlier, the 'true' public-private funding split may be different from an apparent split based on expenditure data.
- Differences in the composition of rural sectors across countries, combined with differing opportunities for profitable private research within each, mean that the 'optimal' public-private funding relativity is unlikely to be uniform across countries. In particular, some research-intensive rural industries in which there is significant scope for private investment are more heavily represented in countries like the United States than in Australia. Relatedly, some participants (see, for example, Southern Farming Systems, sub. DR171) said that, in industries such as chemicals and plant breeding, where there is a heavy private research component, research will be typically done close to the large markets.

- Differences in the broader regulatory environment and intellectual property rules may similarly affect the incentives for private investment in particular countries, and thereby the public-private funding shares that emerge.

Nonetheless, what does seem clear is that in many countries the role of private parties in funding rural R&D research is increasing (see table 2.4). These data also again indicate that the share of private investment in Australia is relatively low by international standards.

Table 2.4 **Private sector share of total agricultural R&D**

Country	*1981*	*1991*	*2000*
	%	%	%
Australia	5.9	20.2	23.5
Japan	36.6	48.4	58.6
United States	50.1	54.3	54.6
OECD	43.9	49.6	55.2

Source: Pardey et al. 2006, quoted in NSW Farmers Association, sub. 145.

For the reasons outlined above, these data too should be treated with some caution. In addition, they do not of themselves indicate to what extent the apparent increase in the private sector share of total investment reflects higher investment by private parties as distinct from any reduction in public funding levels.

Even so, abstracting from the precise public-private split, these data seemingly add to the range of other evidence that the private sector's role is increasing across the globe. Notably, while raising concerns about the particular public-private share for Australia estimated by the Commission, the AFI agreed that there has been this shift (Keogh and Potard 2011) and that it is likely to continue in the future (Across Agriculture, sub. 116).

Australia's RDC model is unique

While other developed countries employ 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 that country's total rural R&D funding.

- *Australia's RDCs have greater spending capacity*. 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 very well supported and well regarded by industry constituents and other stakeholders*. Indeed, as a general approach the RDC model seems to be highly regarded internationally. This is in contrast to levy-based arrangements in other countries. For example, there have been repeated legal challenges against levies in the United States; a campaign to overturn the levy system has been launched in France; and recently New Zealand wool growers voted their levy to zero.

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 fund research, there will be no gain to the community from government funding support to set against the costs of raising the necessary revenue.
- 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 in regard to rural R&D.
- 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 circumstances such mechanisms are unlikely to fully correct for under-investment. Hence, public funding for rural R&D is warranted to promote socially efficient outcomes.
- The aim of public funding support should be to induce socially valuable rural R&D that would not otherwise have occurred.

With Australian governments contributing an estimated $1.1 billion annually towards the cost of rural research and development (R&D), it is important that there be a cogent basis for such a 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. 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 and improved varieties for producers
- enhanced supply chain knowledge, management and efficiency
- 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)

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 that 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)

- 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 instance, producers may have a strong commercial incentive to sponsor R&D into animal welfare where the public's unease about particular practices risks undermining an 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, 2010) 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). 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. Where the investments giving rise to those beneficial

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

		Alston et al. (2000)		*Mullen & Cox (1995) and Mullen (2007, 2010)*	*Shanks & Zheng (2006)*	*PC (2007)*[a]
Average returns		*Research & extension*	*Research only*			
Point	%	81	100	..	24	57
Range	%	..	..	15–40[b]	1–46	48–68

[a] Based on studies examined by OTA (1986) and IC (1995). [b] Mullen (2007, 2010) reported average rates of return at the lower end of this range. .. Not applicable.

Recent empirical work has provided a somewhat deeper understanding of the impact of rural R&D in Australia. Analysis 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 productivity growth in Australia's broadacre agricultural industries. And reflecting the adapative nature of much Australian R&D, Sheng, Gray and Mullen (2010) suggest that overseas R&D investments have had an approximately equal impact on Australian broadacre productivity as domestic spending on research and extension.

Assumptions affect results

Like any quantitative work of this nature, results are heavily influenced by assumptions and methodologies.

- A key issue is the extent to which productivity growth is attributed to R&D investment relative to other productivity drivers.
  - Farm consolidation has allowed for greater realisation of economies of scale and allowed better-performing producers to take over less efficient operators.
  - As noted by Keogh and Potard (2011), 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 satellite-based Global Positioning System has enabled the growth of 'precision farming' practices using automated tractors. Likewise, improvements in pesticides, herbicides and veterinary chemicals used by rural producers are often underpinned by significant R&D spending. In this sense, defining what is 'rural' R&D is not straightforward.
  - 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).

(Continued next page)

Box 3.2 (continued)

  - 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 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. Hence, even in *ex post* evaluations, considerable extrapolation based on past experience is typically required. 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, as alluded to above, 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 individual studies. As discussed in chapter 4 and appendix B, for example, there is substantial uncertainty about whether the recent studies on productivity trends and links to R&D investment in Australian broadacre agriculture are reflective of what has been happening more widely in the rural sector.

These effects taken together justify considerable caution in interpreting estimated returns from past investments in rural R&D. In fact, it may be that the true returns are considerably lower than many common estimates. For example, a previous Commission analysis of portfolio assessments (encompassing a mix of both rural and non-rural R&D projects) 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 investing in rural R&D.

Further details and background on these matters are provided in appendix B.

outcomes would have been undertaken anyway, government funding does not make society better off. Indeed, to invest public money purely on the basis of there being a net benefit for the community from the research concerned 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 the private sector will fail to sufficiently invest in worthwhile projects, and if alternative mechanisms for addressing such market failure are unlikely to be either practical or effective.

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).

In total, while policies 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.

Box 3.3 **Costs of government intervention**

While governments intervene in many markets, often with positive outcomes, 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. They may need to submit applications, complete detailed financial accounts, or attend meetings to justify and explain proposals. In turn, relevant government agencies will incur 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. Importantly, 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 (and according to the specific circumstances), 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.

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Box 3.3 (continued)

Third, to the extent that available public funds 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 consider 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 (or at least under-acknowledged) dimension of government action in this area.

3.2 Market failure

The prevailing view across submissions was that the primary rationale for government intervention in the rural R&D area is to address instances of under-investment by the private sector. There was also general agreement from participants — both subsequent to and following the draft report — 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. In the context of RDCs, 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.

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.

There are nonetheless some particular matters of relevance to the subsequent discussion on the policy implications of spillovers that 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.

Second, differences in how benefits spill over to other 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. The NSW Farmers' Association (sub. DR224) observed that a quick adopter can enjoy an advantage over producers who are slower to embrace new R&D. However:

- 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 often 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
- even in circumstances where producers are pure 'price takers' — that is, prices are set in world markets, and therefore will not be driven lower by domestic R&D — expanded domestic output may increase demand for land, labour and capital. In this case, the initial spillover benefit to producers will be transferred to owners of those inputs (for example, increased prices for equipment and resources, and higher wages for rural workers).

As noted by the Victorian Department of Primary Industries (sub. 161), the significance of any particular market failure can also 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-related issues

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.

The presence of risk[1] 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; and, in the rural sector, producers can hedge against adverse price changes for many agricultural commodities.

In the specific case of rural R&D, access to risk spreading mechanisms may be relatively limited. The venture capital market — a prime source of financing for innovations — is less advanced in Australia than in some other developed economies. Given that there can be particular difficulties in appropriating commercial returns from some types of rural R&D projects (see below), it is hard to imagine significant venture capital interest in possibly many parts of the current rural research portfolio. Moreover, the Department of Agriculture, Fisheries and Forestry (DAFF, sub. 156) observed that the effect of such 'incomplete' capital markets may be exacerbated by the sometimes long lags between initial investments and the generation of a commercial return (section 3.4). To the extent that such factors increase the cost of securing project financing, they may potentially preclude investment in some projects that might have proceeded with readier access to capital.

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1 In commenting on risk-related issues, Dr Russell Thomson and Prof. Elizabeth Webster (sub. DR284) argued that there is a need to distinguish between risk and uncertainty. Specifically, they contended that risk is quantifiable, in that a probability of an event occurring can be estimated; whereas uncertainty cannot be objectively quantified, as there is no information on which to base the probabilistic distribution of outcomes.

While this is true in a theoretical context, the two can be virtually indistinguishable in practice. Even in cases where there is, *ex ante*, an expected distribution of outcomes, a completely unexpected outcome could yet eventuate. Also, where a series of different research projects is undertaken, although the outcomes of each project might be 'uncertain', there is likely to be a bounded range of expected outcomes for the portfolio as a whole (portfolio risk). Therefore, risk and uncertainty can legitimately be conflated in a policy context.

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. 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. 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 participating firms, but also because losses on any particular levy-funded project may be offset by the returns from successful projects.

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. Thus, 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. But in these circumstances, it is not so much risk that provides a justification for government support, as the intra-industry spillovers that might not be realised under an imperfect levy regime.

Indivisibilities

By international standards, the Australian market for many rural industries is small. The diversity of climatic conditions across Australia also 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)

Similarly, a report for the Australian Farm Institute noted that the small size of Australia's rural industries relative to the global market could potentially limit the range of chemicals tested for, and registered for use in, Australia (Keogh and Potard 2011).

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. Although commercial applications may 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 amongst producers 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.

However, 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 be required as well. (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. Yet here again, and as acknowledged by DAFF (sub. 156), collective funding through levies provides a means for producers to pool resources and invest in R&D that they could not undertake individually.

Plainly, where levies are not applied — particularly in the case of those rural industries too small to sustain the collection costs — R&D under-investment can result (section 3.3). This though reflects the free-rider problem that can emerge with intra-industry spillovers, not the relatively small size of any individual producer.

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).

Assuming that such government responsibilities arise due to market failures (for example, the large adverse impact for an entire industry that could result from a single importer bringing diseased plant or animal life into the country), then R&D to support policymakers' activities is entirely consistent with the broader spillover rationale for public funding support. Beyond this, as governments are not generally producers in the rural sector (with the notable exception of forestries), this rationale is likely to have less overall relevance 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.

The Commission's position in the draft report regarding most of these arguments was not substantively challenged. However, a significant number of participants reiterated a belief that food security issues do constitute a legitimate justification for public investment in rural R&D.

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 — including in a recent report by the Prime Minister's Science, Engineering and Innovation Council (PMSEIC, box 3.4), as well as in the draft National Strategic Rural Research and Development Investment Plan (Rural Research and Development Council 2011) —

that R&D has an important role to play enhancing the ongoing 'security' of food (and fibre) supplies through its potential to boost agricultural productivity. Moreover, while such food security issues are normally raised in a global context (specifically in terms of the role Australia can play in funding R&D for developing countries), several participants contended that public funding support for R&D is also necessary to minimise risks to domestic food security in the future.

Box 3.4 **PMSEIC's food security report**

In December 2010, an expert working group convened as part of PMSEIC released a report into Australia's food security. It concluded that, given local expertise in low input farming systems, Australia is well placed to help boost food production in developing countries. The working group also argued that Australia could itself face threats in a food insecure world.

In light of these concerns, PMSEIC (2010a) recommended that:

- an Australian Food Security Agency be established
- investment in agricultural R&D be increased to promote sustainable levels of food production
- incentives be provided to foster a new generation of farmers, researchers and associated professionals in the food production and processing sectors
- the status of food be elevated within the Australian community, and that food value chains be improved.

Many of the issues raised in the PMSEIC review lie outside the scope of this inquiry into the RDC system. Nonetheless, given PMSEIC's recommendation that public investment in rural R&D be increased to address food security concerns, there is some overlap with the Commission's terms of reference.

The views expressed by PMSEIC (2010a) are much the same as the arguments presented by participants during the course of this inquiry. For the reasons discussed in the text, the Commission does not concur that 'food security' provides a robust justification for greater public investment in rural R&D. Although many of the specific issues that may impair food production (for example, land degradation and climate change) are likely to be productive areas for future research, the case for public support for such R&D should still be assessed on the basis of whether socially valuable research would proceed absent that support (section 3.4).

PMSEIC (2010a) also suggested that impediments to private R&D activity should be reduced. The Commission endorses this sentiment, and has proposed measures related to the configuration of the matching contribution for the RDCs (chapter 7) and to the levy system (chapter 10) that may be useful in this regard. It has also canvassed several other potential ways in which private investment might be encouraged (chapter 11).

Food security in Australia

Concerns about Australian food security are commonly predicated on two perceptions.

- Some participants (including Conservation Farmers, sub. DR170; Australian Council of Deans of Agriculture, trans., p. 207) cited research for the Australian Food and Grocery Council (2010) to suggest Australia is a net importer of food.
- Unease has also been expressed that the foreign acquisition of farming land in Australia creates risks for the provision of food to Australian consumers.

The first of these is factually incorrect. The results of the Australian Food and Grocery Council's study have been commonly misrepresented, as it reported on food *and groceries*. A range of non-agricultural items were included in the headline 'net import' assessment, such as cosmetics, detergents and pharmaceuticals.

In fact, notwithstanding the recent prolonged drought, Australia firmly remains a net exporter of agricultural produce, with 56 per cent of all domestic farming output sold overseas (DAFF, sub. 156). For food and food products specifically, DAFF submitted that the value of Australian exports in 2007-08 was considerably more than double the value of imports. Even the Australian Food and Grocery Council (2010) confirms that Australia maintains a trade surplus for both fresh produce and processed food and beverage products.

The second perception implicitly assumes that if foreigners buy Australian land, the agricultural output produced using that land will invariably be sold overseas, resulting in less product choice and higher prices for Australian consumers.

While the globalised markets for many agricultural commodities mean that Australian consumers will at times benefit from lower prices, the Commission readily acknowledges that at other times these same forces can lead to consumers facing higher prices.

However, such price pressures are likely to arise irrespective of whether domestic or overseas producer interests own Australian farming land. That is, wherever they are domiciled, producers will generally seek to sell their output in the market or markets that provide them with the greatest net return. Certainly, this is the basis on which much of Australia's agricultural produce is — and historically has been — exported. Investment in rural R&D is unlikely to be an effective means of pushing against these commercial considerations in determining where available agricultural produce is sold.

Moreover, while prices may sometimes be higher, Australia's income level (and hence buying power) and the somewhat lower costs of selling produce domestically rather than in export markets, suggest that Australia is always going to be in a very strong position to satisfy its food requirements. Again this would be true irrespective of who actually owns the farming land. Additionally, any sustained upward pressure on food prices should in turn provide private motivation (both within Australia and overseas) for productivity improvements and output increases. In this sense at least, private R&D investment will be a consequence of the broader market environment rather than simply a driver of it.

It may be that foreign farm ownership raises other policy issues, which reviews recently announced by the Australian Government (a farm survey to be undertaken by the ABS, as well as an historical study to be conducted by ABARES in conjunction with the Rural Industries RDC) will be able to investigate. But without wishing to pre-empt the conclusions of these other reviews, the Commission would be surprised if credible food security concerns were raised that directly related to the ownership of the nation's farms. In the Commission's view, the prospects of Australian food supplies 'running out' for this — or indeed any — reason appear remote.

Food security at a global level

In a foreign aid context, the risk of hunger and famine affecting developing countries provides a stronger 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 people in developing countries 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. Similarly, 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).

While R&D clearly has a role to play in these circumstances, it is nonetheless only one of several options for improving food output. Of particular relevance in this area 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 sell their produce, the incentive to increase output is severely weakened. Hence, measures that reduce barriers to trade and improve market access should be expected

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 fully realised (sub. 118).

That is not to say that Australia should eschew support for rural R&D in developing countries.

- As well as contributing to Australia's role as a 'global citizen', there may also be some specific spillover benefits for Australia in the form of maintaining or improving domestic research capacity. (Likewise, and reflecting the diffuse nature of research benefits, investment in rural R&D for domestic purposes can also build capacities that are relevant in terms of Australia's ability to contribute to R&D efforts in other countries.)
- The deployment of Australian researchers overseas can provide benefits back to Australia. (For example, Robert Ingram (trans., p. 335) said that his experiences abroad had inspired innovative approaches that he could apply at home.)

However, such benefits are second-order effects: food security is not the *direct* reason for public investment to realise these gains. In fact, they are demonstrations of the broader spillover argument, and should be viewed accordingly.

Moreover, insofar as Australia has an obligation to help feed people in other countries, it is not a matter for rural R&D policy as such. Rather, and as is currently the case, it forms part of the international aid program administered by the Department of Foreign Affairs and Trade. (It is precisely on this basis that the Australian Centre for International Agricultural Research is funded.) The Commission considers that this is a far more appropriate — and probably more effective — approach to addressing food supply problems in developing countries than funding predominantly domestic rural R&D programs in the expectation that at least some benefits might flow abroad.

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 explicit 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; Australian Superfine Wool Growers' Association, sub. DR174).

Maintaining vibrant regional communities undoubtedly has value. Accordingly, concerns are sometimes expressed about structural changes in the Australian economy that are perceived as imperilling this vitality. In particular, with population movements towards urban areas, some rural towns and regions have been (and will likely continue to be) adversely affected.

Nevertheless, 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 farmers and their 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 even a possibility that public funding support for research could in some circumstances work against other policies designed to promote structural reform (chapter 4).

Conversely, where rural industries are intrinsically competitive, then, as noted above, investment in R&D can play a significant role in reinforcing market position, in turn generating benefits that spill over to surrounding regions. This then becomes 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 totally 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 — though 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.

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 — do not generally have 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. Nonetheless, 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.

Were it possible to establish that 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. But it is not clear why this should necessarily be the case — especially if industries can establish levy arrangements, either through voluntary co-operation or government facilitation.

The Commission stresses that the concept of an 'infant' industry should be distinguished from what is merely a 'small' industry (a point also made by the Rural Industries RDC, sub. DR275). Regardless of whether they are established or emerging, small industries (in terms of the value of their output) may have difficulty raising sufficient funds to support even very basic research programs. In these circumstances, and as the Commission's proposed future funding arrangements for the RDCs recognise (chapter 7), some special treatment may be justifiable. However, this is based ultimately on the reduced efficacy of collective funding arrangements in small industries, and is not an endorsement of support for *infant* industries specifically.

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 R&D to further develop domestic links in the supply chain — in the common vernacular, 'from paddock to plate'. Indeed, this concept is embedded in the draft National Strategic Rural Research and Development Investment Plan, particularly for export-focused production (Rural Research and Development Council 2011).

Yet 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 competitive advantage in the processing activity. On occasion, R&D may well help to reinforce or even create such an 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 10 in relation to processor levies, there are reasons to believe that the 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 often greater capacity to conceal the nature of process-related R&D, or to apply IP mechanisms that would limit the access of third parties, 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).

The SA Government (sub. DR203), while agreeing with this position, also observed that spillovers can occur throughout the value chain — noting, for example, that food safety issues can emerge anywhere from the farm gate to consumers' homes. Were R&D to focus exclusively on the commodity production component of the value chain, without any regard to how the product was used or consumed, it is conceivable that issues of community-wide significance could be neglected. However, the Commission sees no evidence to suggest that the existing framework is failing to recognise such issues. Nor is it convinced that extra public funding for rural R&D would generally be the appropriate way to overcome any such problems if they did arise.

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.

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) right protections and industry levy arrangements. (Reforms to reduce regulatory burdens can also help to increase the returns to private investment in R&D, as discussed in box 3.5.)

Intellectual property rights

As alluded to above, some innovations can be successfully 'hidden' from rivals, such that the benefits accrue only to those who invest. Where secrecy cannot be maintained, various legal mechanisms can be used to protect investors' rights.

Box 3.5 **Regulatory reform**

Regulation can sometimes act as an obstacle to innovation — for instance, 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. As noted by the Council of Rural Research and Development Corporations (sub. 128) and Keogh and Potard (2011), restrictions on the use of new technology and techniques — such as, 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 of less stringent controls.) 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, unilateral streamlining initiatives by Australia 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, there would still tend to be under-investment from the community's perspective.

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. Furthermore, IP protection will be more effective in some industries than others (box 3.6).

That said, determining how far IP rights should extend can be 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.

Box 3.6 **The limits of intellectual property**

The extent to which a business can take advantage of IP protections 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.

Yet 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.

A further constraint exists where there is a potentially large number of users: the enforcement 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)

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.

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. 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. Furthermore, since the RDCs sometimes jointly conduct research (chapter 5), inter-industry spillovers can potentially be captured and internalised within a broader range of rural producers.

There are nonetheless some reasons why levy arrangements, on their own, are unlikely to always encourage primary producers to invest in a socially optimal level of R&D.

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 will tend not 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), levies might still be set below the level that would be optimal for an industry given the returns that the research concerned would provide.

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 expected 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 directly contribute.[2]

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 lower-risk and 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 sometimes swiftly 'pass through' the system. As noted in section 3.2, the less time it takes for competitors to appropriate the outcomes of

[2] As chapter 10 discusses, there are nonetheless reasons against extending processor levies. And even were such levies to be applied more widely, this might still fail to counter perceptions about the inequitable distribution of benefits across the entire value chain.

one producer's R&D, the lower the benefits to that producer. In a collective sense, if producers perceive that most of the benefits from their levies are likely to be appropriated by consumers or the owners of other input factors (land, labour and capital), 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', which might be expected to allow for adjustments in prices and quantities to eventuate more quickly.

That said, the levy arrangements are in place because free riding presents a worse outcome. Indeed, even if the benefits of research rapidly pass through the system (with many accruing to other parties), producers will still generally be better off than if they had not invested at all. 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 (or other factors of production) is expected to be rapid, the threat of relative decline 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 typically accrue over time, with large upfront investments not delivering benefits for several years.

From a project investment perspective, 'lags' of this nature 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 (a relevant consideration when the median age of Australian farmers is approaching 60 — as noted by Meat and Livestock Australia, sub. 106).

Lags in the realisation of benefits are partly a function of the rate of scientific progress — research does not instantaneously produce results. As one example,

Alston, Pardey and Ruttan (2008) estimated that the lag associated with developing new crop varieties can be 5 to 10 years.

But not every producer will embrace such applications as soon as they are made available. Again in the case of crop varieties, Alston, Pardey and Ruttan (2008) concluded that the benefits from R&D might not peak until 15–25 years after an initial investment is made — roughly double the lag in generating a usable research output.

Any given project will demonstrate a mix of lags. Some projects may have long research lags and then be quickly adopted (which would be consistent with the rapid dissipation story discussed above). Others may have relatively shorter research lags, with widespread adoption taking considerable time.

Where adoption occurs slowly simply because farmers themselves have chosen not to take up a new product or productivity-improving approach, the case for supplementing the levy regime with other measures would be very weak.[3] Plainly, it is not the role of public policy to offset such poor decision making within an otherwise sound framework.

But where lags in the realisation of research benefits relate to the time taken to develop commercial applications — or where there are deficiencies in extension arrangements that further delay adoption — the efficacy of the levy system for achieving an appropriate amount of research investment is more open to question.

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 an appreciable effect on a producer's profitability and, as with public funding, have an opportunity cost.

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3 Indeed, if diffusion generally occurs slowly, the case for a levy regime is itself weakened. That is, slow rates of diffusion mean that innovators are more likely to be able to capture sufficient benefits in the short to medium term to make the investment worthwhile. At least in these circumstances, the extent of the free-rider problem may be no greater than in other parts of the economy (a point alluded to by Hans Huebner, sub. 222).

Still, 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. In these circumstances, it seems likely that primary producers would judge the intrinsic worth of R&D levies versus spending in other areas (such as new capital equipment, or increased use of inputs) on the basis of standard investment considerations.

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

> … 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 shorter term are effectively fixed (chapter 10) — 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. But 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).

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. Also, unlike many primary producers, larger individual entities

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

		Dairy industry					*Sugar industry*[a]		
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[b]	$	80 417	85 440	22 321	130 261	78 788	67 285	93 581	6 763
Levy payment ÷ farm cash income	**%**	**2.9**	**3.3**	**11.3**	**1.6**	**2.3**	**0.8**	**0.6**	**8.9**

[a] Canegrowers only. [b] Difference between total cash receipts and total cash costs (excluding capital and household expenditure).

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

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 to producers within an industry. 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. Likewise, the costs to many woolgrowers of adopting alternatives to 'mulesing' sheep currently appear to be greater than any direct private benefits.

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. (In the case of mulesing, for example, public concern about the practice may impose a penalty on producers through weaker consumer demand.) But such factors will frequently be insufficient to ensure appropriate investment of levy funds in these areas, especially where the source of an environmental or social problem is difficult to ascertain (and therefore where it is difficult to identify precisely who should be accountable).

Accordingly, it is likely that plenty of wider community benefits would go unrealised if it were only levy arrangements that were employed to address spillover-related under-investment concerns. This point was emphasised 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 the factors that may reduce the effectiveness of levies in a single-industry context, it would be naïve to assume this would always (or even generally) be the case. In short, while levies are a very important component of the suite of policies that can promote an appropriate level of investment in rural R&D, reliance on this instrument alone would nonetheless see some socially desirable projects go unfunded.

Public funding

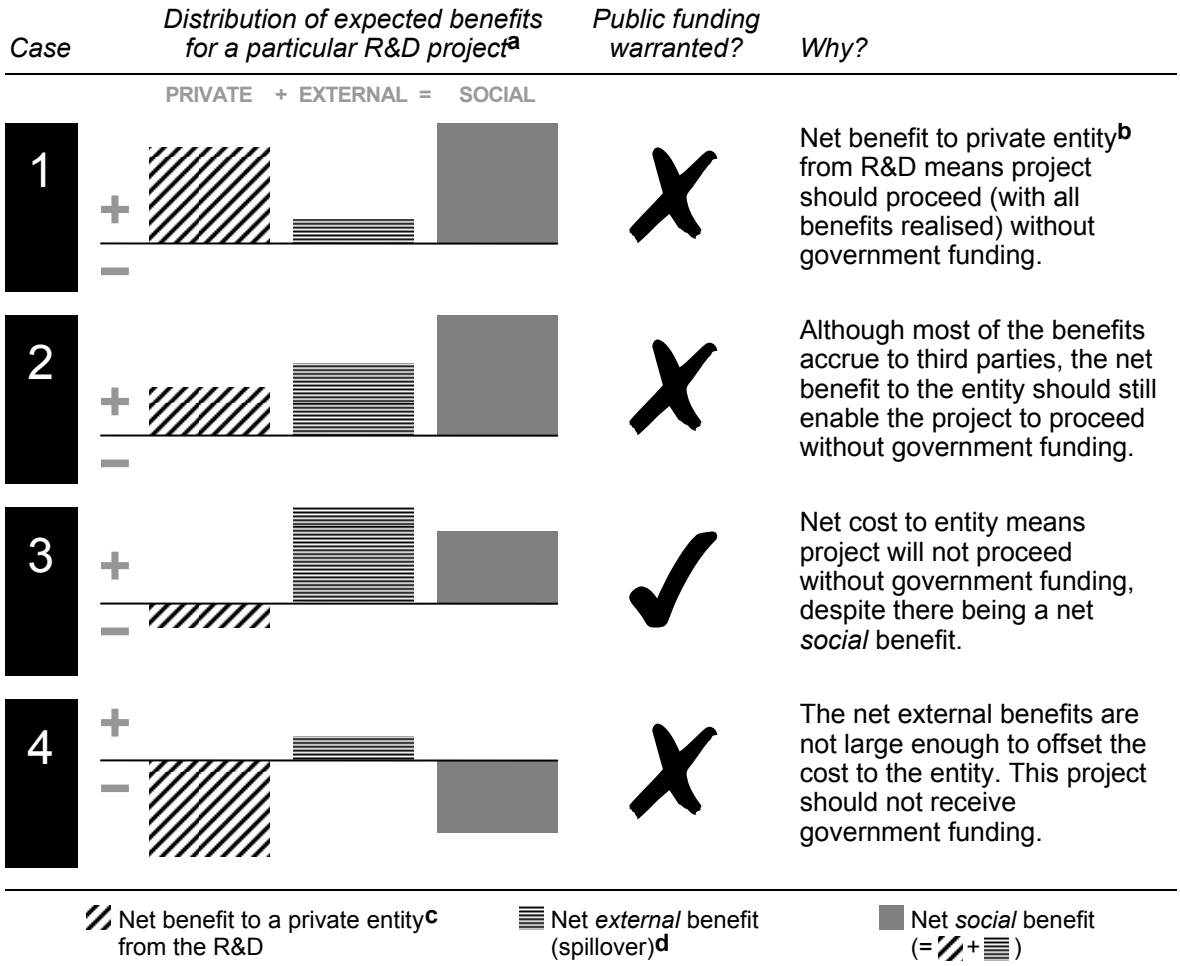
Given that the 'non-funding' options available to government to promote rural R&D are unlikely to be sufficient to fully overcome spillover-related under-investment, public investment will be warranted in certain circumstances to help achieve socially efficient outcomes.

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 producer 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.

As a stylised illustration of this principle, figure 3.1 provides four different scenarios to depict where and how public funding support might be justified.

- Case 1 may be indicative of many on-farm productivity-enhancing R&D projects — for example, a research project to increase crop yields.
- Case 2 shows high levels of spillovers to other parties (for example, the broader community, or producers in other industries), but also net benefits (after applying an appropriate risk-adjusted discount rate) to the entity involved. An example of this could be research into reducing on-farm water consumption. Such a project could have proportionately high environmental benefits, though it may also reduce costs for producers.
- Case 3 has broad applicability in a range of contexts.
  - *Intra-industry spillovers*: As discussed earlier, because of free-rider problems, the benefits enjoyed by an individual producer may be insufficient (relative to the research costs) to warrant investment in a socially valuable, productivity-focused piece of research. And for the reasons outlined above, industry levies will not always fully correct for such under-investment.
  - *Inter-industry spillovers*: A research project that could benefit several rural industries each by a small amount might not be privately funded because, for any individual producer or industry, the cost of the research relative to its benefits would make it unattractive. As with the intra-industry spillovers discussed above, unless there are effective mechanisms for facilitating collaboration, such a project would — absent public funding support — potentially not be undertaken. (Irrigation research may be one such example.)

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



[a] Assumes for simplicity an 'all or nothing' choice 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. [b] 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). [c] Expected net benefits to the private entity are exclusive of any 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. [d] Includes the administrative and efficiency costs of government revenue raising.

– *Spillovers to the wider community*: Public funding support may be justified where there are large spillovers for the wider community, but where (in contrast to case 2) any direct benefits for a producer or industry would be less than the costs they would incur.[4] Falling into this particular category could be the aforementioned example of research aimed at addressing poor land use practices that result in environmental degradation.

4 The presence of a net private cost does not mean that producer adoption of publicly subsidised research outputs will necessarily be weak — a concern raised by the Cattle Council of Australia (sub. DR244). That is, there could still be benefits to producers, but, *absent any public funding*, these would be exceeded by the private costs.

- Case 4 represents a project with only modest spillover benefits and substantial net private costs. This could represent virtually any project with a low probability of providing a return to a producer or industry (which faces the certain cost of investing in the project), but benefits to the surrounding regional community (which bears no direct research cost) in the unlikely event that it was successful.

In summary, 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.

The Commission's analysis of additionality stimulated substantial commentary by respondents to the draft report.

- Many viewed the term 'socially valuable R&D' as synonymous with R&D that produces a high proportion of 'public' benefits (rather than being predominantly beneficial to industry — in other words, high in 'private' benefits). Hence, they expressed concern that the Commission's additionality principle meant that public funding should support only rural research aimed at benefiting non-industry interests.
- Some suggested that the stylised examples provided in figure 3.1 did not account for circumstances where public funding might cause the overall size and relative distribution of benefits to vary.
- Several others (including the Council of Rural Research and Development Corporations, sub. DR260) argued that additionality was too abstract a concept to be successfully applied in a policy setting.

The implications of the additionality concept for policy making, and the ways by which the concept can be applied, are discussed at length in chapter 4. Nonetheless, it is worthwhile at this juncture to offer some clarifying responses to these 'in principle' concerns.

Additionality and 'socially valuable' R&D

In developing rural research programs, there is no precise demarcation between private and public benefits. Most R&D outputs will lie somewhere along a public–private spectrum rather than at either extreme, and it will rarely be possible to forecast the exact distribution in advance of the research being undertaken. (A further complication, noted earlier, is that the relative mix of public and private benefits can change over time.)

In this context, the Commission stresses that the additionality concept is not exclusively linked to research at the 'public good' end of the spectrum. As discussed earlier, 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 worthwhile project is pursued. This would be as much a market failure as neglecting a project with predominantly community benefits.

Put another way, it is desirable that research proceeds where the sum of the expected benefits to all of the parties in society (including industry) exceeds the sum of its costs — regardless of whether the benefits flow mainly to one particular rural industry, to a group of industries or to the wider community. Where there are insufficient benefits to an individual private investor, or a levy-paying industry collectively, to make such a 'socially valuable' project worthwhile, public investment would be warranted.

Dimensions of additionality

One of the simplifying conditions attached to figure 3.1 is that the nature or scope of the project being evaluated is not of itself dependent on whether government investment is forthcoming. However, as the WA Department of Food and Agriculture observed:

> Additional public funding could cause the size of private and external benefits to be greater than otherwise would be the case in the absence of such public funding. … The ratio of additional external benefits to public funds could be sufficiently high to make the investment highly ranked. (sub. DR243, p. 4)

The Commission agrees that public funding may, for some projects, 'buy' additional benefits that would not be generated by purely private investment. For example, an industry might undertake research into a new production technique that would deliver productivity benefits but also potentially impose new environmental costs (say, higher greenhouse gas emissions or increased soil erosion). In these circumstances, public funding could allow the project to be reconfigured to investigate complementary means to limit the environmental impact without necessarily compromising the benefits to industry. Other parameters of when and how the project is undertaken may similarly be influenced by public funding (box 3.7).

But these sorts of dimensions do not of themselves negate the key message emerging from the additionality concept — namely, that public funding should add genuine value. In short, if public funding allows for qualitatively different projects from what the private sector would otherwise undertake, and where the additional benefits exceed the costs to government and other parties, public investment will be justified.

Box 3.7 **Is 'early' R&D additional?**

As discussed in chapter 5, 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 research project until it approached exhaustion of its existing production capacity. If it were not expected to face capacity constraints for several years, it might delay R&D. Yet 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) could be justified.

That said, bringing forward R&D is not guaranteed to be socially desirable. It risks promoting investments in resources that would 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 theory, timing dimension issues can be important parameters in considering additionality.

Judgement is required

The additionality concept is not intended as a prescriptive rule for the beneficiaries of government subsidies in determining whether or not to invest in specific projects. Instead, it is a principle for the Government to consider in setting and reviewing RDC programs. (That said, to the extent that they have an interest in justifying the public funding they receive, it may be advantageous for RDCs to periodically view their overall research portfolios through the prism of additionality.)

Moreover, it is manifestly difficult for policymakers to determine whether particular projects would have proceeded without public funding. By definition, the counterfactual outcome cannot be directly observed. Hence, at a practical level,

judgement is required by government about where — at a program-wide, rather than project-specific level — it should invest.

As such, additionality should be viewed as a starting point for policymakers to think about how public funding can best be deployed. Necessarily, it calls for a 'common sense' approach, recognising both the complexity of the policy environment and the objective of maximising the net benefit derived for the whole Australian community from the public investment in question. These matters are considered further in chapter 4.

4 Public funding principles

Key points

- Government rural R&D programs should be premised on a consistent set of public funding principles.
  - These principles should indicate: the role of investment in rural R&D and the basis for government to contribute to its cost; the relationship of R&D policies to 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.
- The various empirical studies looking at the relationship between investment in rural R&D and productivity growth in the sector provide an important indicator of the benefits of past research — but not a sensible stand-alone basis for future policy setting.
  - Such studies are subject to various methodological and data-related caveats.
  - Even if it could be categorically established that current R&D investment levels were too low, the studies would provide no guidance on how individual policies should be adjusted to deliver good results from a higher level of investment.
- Establishing broad targets for overall spending on rural R&D would likewise be of limited benefit, and could have significant costs were those targets used to 'drive' policy settings. Rather, the emphasis should be on ensuring that:
  - the framework is comprehensive and soundly based
  - available funds, public and private, are spent wisely and there are timely and effective funding responses to emerging research needs.
- There are reasons to believe that Australian governments are shouldering too much of the responsibility for funding rural R&D. However, the case for changes to public funding for individual programs must still be assessed on the basis of program-specific benefits and costs — having particular regard to the likelihood that public funding will induce a reasonable amount of additional, socially valuable research.

For the reasons set out in chapter 1, in this inquiry, the Commission has focused primarily on how to enhance the efficiency and effectiveness of the Rural Research and Development Corporation (RDC) model, rather than on how to improve the rural R&D framework as a whole.

Undertaking detailed assessments of components of broad frameworks and adjusting policy settings on the basis of those assessments is a common practice. Indeed, without this sort of focused approach, policy reform would often become intractable.

At the same time, it is important to guard against the possibility that changes predicated on an analysis of the RDC model alone could diverge from those that might have emerged from a comprehensive review of policy settings across the entirety of the rural R&D framework. This is especially the case as whatever the deficiencies in the model, it is seemingly one of the better performing components of the framework — a point emphasised by many inquiry participants.

One way to greatly lessen risks of this nature is to have in place a generally applicable set of public funding principles against which the efficacy of individual funding programs can be assessed. Even if a particular program is then considered in isolation, any changes necessary to promote compliance with such principles are likely to be much the same as the changes that would emerge were that same program to be assessed as part of a framework-wide review against the same principles. Indeed, premising public funding and other forms of government intervention on clear and soundly based principles is a generally accepted component of best practice policy making.

Notably, there is currently no such set of principles to guide rural R&D policy makers. In the Commission's view, remedying this gap would be of considerable value. As well as facilitating effective and consistent assessments of individual parts of the rural R&D framework, introducing a 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. While 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, there is clearly still an entitlement mentality in parts of the sector. 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.'

Central to the Commission's proposed public funding principles is the additionality concept described in the previous chapter. That is, governments should only contribute funding for rural R&D where that funding is likely to add genuine value by inducing a commensurate amount of socially valuable research.

However, additionality is not the only requirement for efficient and effective public funding programs. The role of R&D funding programs within the broader suite of policies designed to maintain a productive and sustainable rural sector must be clear and appropriate. Good program design and robust accountability requirements are also very important in helping to ensure that available funding is spent wisely.

In the subsequent chapters that assess the RDC model and possible alternatives to it, the Commission has drawn heavily on its proposed public funding principles — though it reiterates that these principles are intended to be generally applicable to future policy reform initiatives across the rural R&D framework as a whole.

4.1 The basis for government involvement

Placing the role of rural R&D in context

Past investments in rural R&D — including by the RDCs (see chapter 5) — have contributed significantly to improving the productivity of Australia's primary producers (as well as providing wider environmental and social benefits).

That said, R&D is only one of many 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 an 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, because a sizeable part of Australia's rural R&D effort sensibly involves adapting core rural R&D technologies and genetic material/varieties developed in other countries to meet local requirements, much of the ensuing productivity benefit is ultimately 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 by rural policy makers. A contemporary illustration of this is the 'big vision role' for rural RD&E mapped out by the Rural Research and Development Council (2011) in its recently released Draft National Strategic Rural Research and Development Plan. In these circumstances, the risk is 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 farm consolidation. Even worse, were investments in R&D to be focused unduly on

keeping uncompetitive primary producers in business, they could impede structural adjustment in the sector and detract from the effectiveness of other policies in place to facilitate change.

The same issue also arises 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 directly take account of any adverse impacts their activities have on the environment.

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

- investment in R&D complements and augments, rather than supplants, other drivers of productivity and performance improvement
- public funding — and any related funding instruments such as compulsory producer levies — are not the only policy levers available to address potential under-investment in rural R&D
- 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 outlined in chapter 3, 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 that emerges from this does not provide a precise basis for determining how much governments should contribute to the cost of rural R&D. Predicting what impact public funding support is likely to have on the level and mix of research undertaken will not always be easy — a point emphasised by many participants in responding to the draft report (see below). Hence, application of the additionality concept will necessarily require those determining and implementing rural R&D funding policies to exercise judgement — often in the context of the likely outcomes across a program as a whole, rather than in relation to individual projects receiving support through that program.

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 investments in rural R&D are likely to provide a net benefit to the community removes any consideration of whether a government contribution is actually necessary to ensure that those investments proceed. At the extreme, this reasoning would justify public funding for any viable investment even if all of the benefits flowed to private parties who would otherwise be prepared to meet the full cost.
- Targeting public funding support on socially valuable cross-sectoral research, and/or research 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 certain types of R&D 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, as discussed in chapter 3, because the industry levy system is unlikely to fully address free-rider problems, producers may vote for levy rates that are insufficient to fund all socially valuable, productivity-focused research.

Public funding for rural R&D that does little to induce additional research activity may still be a 'less worse' 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. But if public funding for rural R&D were simply replacing private funding, then returning the government contribution to taxpayers, or redirecting it to 'value adding' programs outside the rural sector, 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. While practical application of the concept by policy makers would call for judgement, such a need would hardly be unique to this particular area. Rarely, if ever, will there be sufficient information available to determine precisely how public funding programs should be configured to deliver the greatest benefit for the community. Hence, judgements on likely additionality, even if implicit or couched in terms of getting the best bang for the buck, are a key element of such policy formulation. The Commission further notes that:

- additionality-related considerations are already explicitly brought to bear in the allocation of some public funding for rural R&D — see, for example, the Victorian Department of Primary Industries (sub. 161, p. 4) and CSIRO (2006, p. 63)
- the concept was, in broad terms, recognised when the RDC model was introduced, with the Government's matching contribution intended to help fund research that levy payers may not have been prepared to fully fund themselves (see Dairy Australia, sub. 265, p. 4)
- the broad concept is similarly 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 individual government funding programs would add to other 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 most likely to induce a reasonable amount of additional, socially valuable R&D, these requirements include:

- incentive structures and design features that encourage the efficient provision of quality research outputs — including by 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 worthwhile research outputs by intended users

- governance, evaluation, reporting and research dissemination requirements that:
  - promote transparency in regard to intended and actual program outcomes
  - make those involved in procuring, managing and supplying R&D accountable for their performance
  - help to ensure that the results of past research work are suitably accessible to the various stakeholders, including the next generation of researchers
- 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 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 earlier, the Commission has not undertaken a comprehensive assessment of the overall rural R&D (and extension) framework, concentrating instead on the RDC arrangements. Yet as the following discussion of aspects of the framework illustrates, there is undoubtedly considerable scope for improvement in the basis for, and the design and governance of, individual programs — and more particularly in the way they come together as a funding and delivery regime. The ability to reference a set of 'best practice' program design requirements could provide impetus for such improvement.

Coordination issues

As the RDC experience (see chapter 5) illustrates, there has been considerable collaboration and coordination between those procuring and supplying rural R&D. Indeed, 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 unproductive duplication of research effort.

Even so, with policy and program responsibilities split within and across levels of government, there is also significant compartmentalisation within the framework. Thus, in its submission to the Commission's 2007 study into Public Support for Science and Innovation, the Department of Agriculture, Forestry and Fisheries (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)

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 become 'an easy "solution" for a government looking for a quick exit from a hard problem.' Moreover, initiatives such as the National Primary Industries RD&E Framework may well help to address current fragmentation problems.

However, 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 better data on funding and spending across the entirety of the framework would therefore be highly desirable. In the Commission's judgement, there would also be value in a 'low key' mechanism to better coordinate rural R&D policy and program formulation within the Australian Government. The case for specific policy initiatives of this nature (see chapter 11) is in turn illustrative of the need to reflect the importance of effective program coordination in the proposed high level public funding principles.

Leveraging issues

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 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.

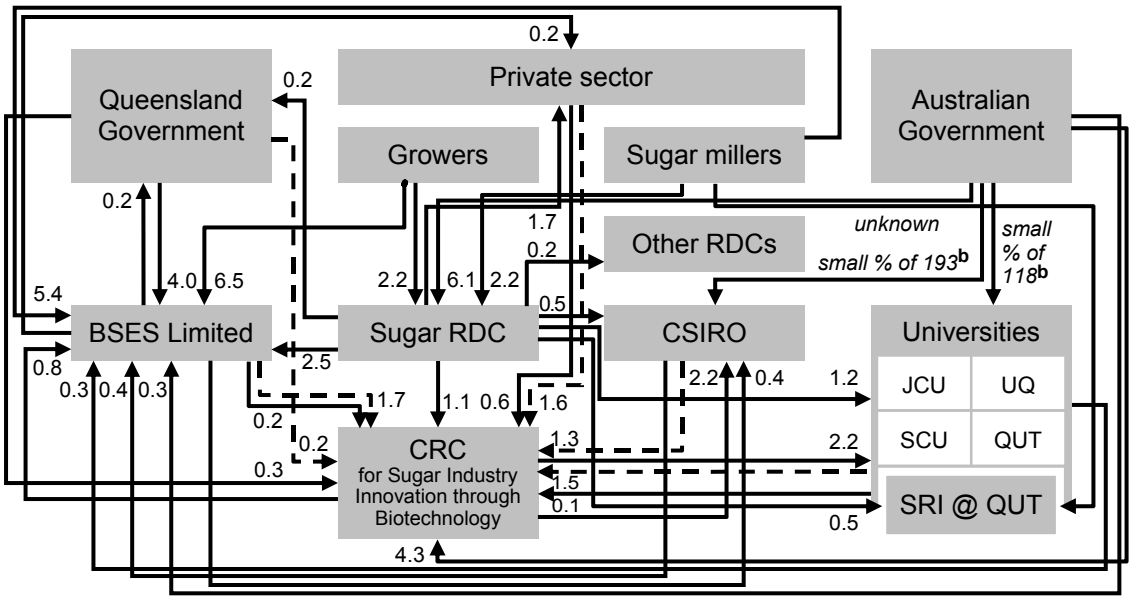
Such 'leveraging' has many benefits. In particular, it may provide a means to: share costs and risks across the intended beneficiaries of an R&D project; cater for projects that would be too large for any one funding entity to sponsor; and draw in different sorts of scientific, financial and management expertise to enhance the quality and timeliness of a project.

At the same time, as box 4.1 illustrates, where there is extensive leveraging, it becomes much harder to see what the various parties are actually contributing to the costs of projects. Such lack of transparency can in turn render effective monitoring and program evaluation considerably more difficult and thereby indirectly reduce the incentives for efficient service delivery. Also, as the sugar example in box 4.1 highlights, the amounts of funding involved in individual leveraging arrangements are often relatively small — meaning that the associated transactions costs are likely to be proportionately high.

Box 4.1 **The complex 'money-go-round'**

Assembling robust data on overall funding for, and spending on, rural R&D is made much more difficult by 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.

An example of the complex web of players and funding flows is shown below for sugar industry research in 2008-09.[a] The Commission was told that were the same exercise to be undertaken in other rural industries the outcome would be similarly complex.



[a] Funding for R&D, in millions of dollars. Dashed lines denote in-kind funding. [b] See table 2.1.

Moreover, the division of public funding responsibilities across and within governments, together with the indirect nature of some of this funding support, can sometimes provide incentives for leveraging that has few benefits other than to shift costs onto other parties. For instance:

- An RDC can make its funds stretch further by using its buying power to effectively appropriate all or part of the funding supplementation that

universities receive when they perform commercial research work for (or in some cases collaboratively with) third parties. In effect, the services concerned are 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 the CSIRO to supplement its block funding with a significant amount of revenue from contract research. In commenting on this matter, the CSIRO said that:

  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. (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.

The scope for this sort of cost shifting may also 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 supply of R&D 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, the CSIRO (sub. 123, p. 14) argued 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'.

In drawing attention to the potential for such outcomes, the Commission is not seeking to cast aspersions on those parties which have taken advantage of available opportunities to the benefit of their particular stakeholders. It is perfectly reasonable for them to do so.

Further, because of the many benefits of leveraging, seeking to generally curtail the practice would not be appropriate. Indeed, as discussed in chapter 11, the changes necessary to preclude the sort of cost-shifting behaviour detailed above could themselves have significant downsides (and ramifications extending well beyond

the rural R&D arena). Accordingly, an element of 'unproductive' cost shifting is most probably unavoidable.

However, making reference in the proposed public funding principles to the desirability of discouraging leveraging that is motivated solely, or largely, by a desire to shift costs onto other parties, may help to shine light on more egregious instances of such behaviour. It might also help to focus attention on any aspects of the design of particular rural R&D funding programs that augment the more general incentives and opportunities for unproductive cost-shifting.

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)

Lending empirical support to this contention, very recent research by ABARES (Sheng, Gray and Mullen 2010) found that the total benefits for producers and others in the community from past (public) investment in extension have been nearly as large as from the investment in the preceding research.[1]

Many of the concerns raised by participants in relation to extension and 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)

Achieving an appropriate balance between private and public funding for extension services is important for the effectiveness of extension outcomes. (Some particular issues that arise in this context are discussed in chapter 11.)

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[1] This finding is subject to the general caveats on empirical studies in the R&D area (see section 4.2 and appendix B). There are also seemingly many empirical challenges in taking account of the various linkages between research and extension. That said, a finding of a significant overall return to producers and other parties from (public) investment in extension activity accords with the critical importance of widespread adoption to the realisation of the benefits of rural R&D.

However, in the Commission's view, an even more fundamental policy requirement is to ensure that the adoption of research outputs is treated as an integral part of the R&D planning and delivery process. As discussed in chapter 5, 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)

Adoption problems do not exist in all areas. For example, several West Australian grain interests told the Commission that the uptake of worthwhile innovations in that sector has often been rapid. More broadly, the National Primary Industries RD&E Framework initiative should help to give higher priority to adoption issues across both the public and private components of the framework.

Nonetheless, the Commission considers that the importance of ensuring that there are mechanisms and resources available to facilitate the adoption of research outputs should be reflected in the proposed public funding principles to guide government investment across the framework. This is especially the case as the overall balance between public and private funding in the extension area continues to evolve.

A still developing evaluation culture

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 investment in rural R&D in aggregate (see section 4.2); 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 guidance on whether available rural R&D funding was delivering best value to primary producers and the wider community
- highlighted means to improve service delivery and increase adoption, and thus boosted the payoffs 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 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 evaluation process for the RDC program 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 9). To reinforce this attitudinal change, the Commission considers that robust project evaluation — before as well as after the event — should now be entrenched as an integral part of the rural R&D framework.

A greater commitment to evaluation — and the incentives this would provide for improvements in the quality of evaluations — would not, of course, remove the need for judgement in decision making.

- While good evaluation data will be of considerable assistance to those entities investing in rural R&D, there will always be uncertainty about whether a proposed project will succeed and, if it does, precisely what benefits it will deliver.
- Similarly, whatever the benefits that have come from, or are likely to come from, specific projects, when deciding on how much to contribute to an R&D support program, Governments will still need to make judgements on the likely degree of additionality attaching to public funding across the program as a whole.

Nonetheless, as AgForce (sub. DR238, p. 20) observed, robust ex ante and ex post evaluation should be viewed as a critical component of a larger continuous improvement process. Beyond incorporation in the proposed new public funding

principles, the National Primary Industries RD&E Framework and National Strategic Rural R&D Investment Plan initiatives would be two other vehicles for heightening the focus on timely and effective evaluation.

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. In particular, while Australia's focus on adapting overseas technologies to meet local requirements is a sensible one, 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 reduce the likely research additionality attaching to the public funding contribution.

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.

Even so, its discussions with a wide cross-section of stakeholders have left it with the impression that, in two areas at least, some change to the current research balance could be beneficial. 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. 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 (HAL) — 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).[2] Notably, the Commission was struck by the seemingly much greater emphasis given by entities investing levy funds in New Zealand, including in the horticulture sector, to larger-scale, 'game-changing' research.

Against this backdrop, the Commission gave consideration to including a research balance provision in its proposed public funding principles. However, it concluded that research balance issues are generally better assessed in the context of specific funding programs (recognising that such assessments must, in turn, have regard to relevant research being sponsored elsewhere in the framework — a point emphasised by the Horticulture Taskforce (sub DR283, pp. 21–2).) To this end, the Commission's proposed new RDC principles (see recommendation 9.1) refer to the need for RDCs, as a condition for receiving government funding, to invest in project portfolios that appropriately balance long-term and short-term, high-risk and low-risk and strategic and adaptive research needs. This requirement is in turn consistent with the broader public funding principle that government support should add genuine value by facilitating research that would not otherwise have been undertaken.

Responses to the draft report

A considerable number of respondents to the draft report — including some RDCs — supported the idea that there should be an overarching set of public funding principles to help guide government investment across the rural R&D framework. The Government of South Australia, for example, said that a set of principles:

> … covering: the basis for government to contribute to the cost of rural R&D; the relationship with other policy levers; and good program design features, is essential for ensuring that R&D into the future is efficient and effective. (sub. DR203, pp. 5–6)

(Others to voice support for the sort of principles enunciated in the draft report included: Cotton Australia, sub. DR220; CSIRO, sub. DR219; Irrigation Australia, sub. DR262; Red Meat and Livestock RDCs, sub. DR252; the Rural Industries RDC sub. DR275; and the Victorian Department of Primary Industries, sub. DR168.)

Indeed, much of the opposition to the draft report proposal seemingly reflected unease about some of the individual principles, rather than about implementing a set of principles as such. In particular:

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[2] The Mushroom Growers Association of Australia (trans., p. 92) said that spending by HAL on mushrooms research often took the form of contributions to sizeable global projects. However, even making allowance for such collaborative research would not fundamentally alter the thrust of the observation the Commission is making.

- The CRRDC (sub. DR260) and Dairy Australia (sub. DR265), amongst others, raised concerns about the proposed principle that the aim of government funding should be to induce socially valuable R&D that would not otherwise be undertaken. The CRRDC (p. 8), for example, said that it could not:

  > … agree that a rule of thumb which requires a common sense approach to its application can at the same time constitute a clear and soundly based principle, or provide an effective benchmark for evaluating performance or promote accountability for outcomes achieved …

  More specifically, Dairy Australia (p. 11) interpreted the principle as meaning that an RDC would have to demonstrate additionality for each and every project for which it sought matching funding.
- The CRRDC was also opposed to making reference in the principles to non-R&D drivers of performance improvement in the rural sector, arguing that it was unclear how this role should be recognised in specific funding contexts.
- The Cotton RDC (sub. DR248) was one of several to raise concerns about reference to discouraging leveraging that is administratively costly and/or designed solely to shift costs — contending that it was unclear how such leveraging could be singled out from leveraging that contributes to better research outcomes.

There was, however, some broader concern about whether any set of principles would do much to improve policy making in the rural R&D area. In this regard, DAFF said that:

> … there is not a sufficient uniformity of objectives and frameworks across all Australian, state and territory government programs that provide funding to rural R&D to make such principles useful or applicable in practice. (sub. DR266, p. 14)

DAFF went on to argue that the usefulness of the principles would be further limited by the fact that many programs that provide some funding for rural R&D lie outside the rural policy portfolios (see chapter 2). In this context, it pointed to the Framework of Principles for Innovation Initiatives, adopted by Australian, State and Territory Governments in December 2009, which is intended to 'enhance consistency and improve the overall accessibility and efficiency of government innovation initiatives across Australia' (see DIISR 2009).

The Commission's assessment

The Commission is not surprised by the opposition of some industry stakeholders to an emphasis on additionality in regard to government funding support. As alluded to above, government funding for rural R&D has historically been predicated heavily

on the high level linkage between investment in R&D and productivity growth; and on the notion that, whenever research is likely to have wider benefits, a government contribution is necessarily called for.

However, the Commission reiterates that these are not of themselves a robust basis for government to contribute to all types of rural R&D investments. What is required is a likelihood that the government contribution will add genuine value by facilitating socially valuable research that would not otherwise have been undertaken. In the Commission's view, as an objective, this cannot be reasonably disputed. Moreover, while the application of the additionality principle to the configuration of public funding programs for rural R&D will necessarily involve judgement, as noted earlier, such judgement is inherent to almost any decision involving the allocation of scarce public funds. So too is the need to call on 'rules of thumb' — such as the likely distribution of benefits across the various stakeholders — to help indicate whether government funding is likely to make a real difference.

Likewise, the Commission does not see the application of the additionality principle as involving onerous new procedural requirements for RDCs or others procuring rural research for which government is meeting a part of the cost. The Commission's emphasis on additionality is directed at ensuring that *governments* are more conscious of the need to avoid spending scarce funds on research that primary producers would have had sound financial reasons to fund themselves. Certainly it is not the Commission's intention that an RDC (or other procuring entity) would have to demonstrate additionality on each and every project in order to retain its public funding. Rather, any additionality-driven decision to change public funding support (up or down) would be based on a broader 'ex post' assessment of outcomes across a program as a whole.

The draft report principle relating to the discouragement of unproductive leveraging was similarly not intended to require a forensic delineation between 'good' and 'bad' leveraging. Instead, the objective was to ensure that the potential downsides of leveraging are not ignored. More specifically, as noted above, this might be valuable in shining light on any egregious instances of such behaviour and in helping to ensure that the design of individual rural R&D programs does not augment more general incentives and opportunities for unproductive cost-shifting. As well, the principle could serve to:

- reinforce the onus on government research suppliers to deploy their resources in a manner consistent with their core responsibilities
- remind those procuring rural research of the administrative costs that can attach to a large number of small value leveraging arrangements. As the example

provided in box 4.1 illustrates, it is far from clear that this notion is 'front of mind' at present.

The 'front of mind' issue is also the reason why it is important that there is explicit recognition in the policy framework that investment in R&D is not the only contributor to productivity growth in the rural sector. As the input to this inquiry illustrates, this message is easily lost, especially when public funding issues are in the spotlight.

The Commission acknowledges that its proposed principles will not have direct application to public funding that comes from programs outside of the primary industries portfolios. But it does not see this as a reason to eschew a robust platform for the large amount of public funding that does come through these portfolios. It further notes that:

- The proposed mechanism for better coordinating Australian Government funding for rural R&D (see recommendation 11.1) would potentially allow the principles to be given wider airplay within the Australian Government sphere at least.
- It is putting forward a specific approach for implementing the principles that reflects the dual roles of the Australian and State and Territory Governments in this area (see below).
- While the recently agreed innovation framework principles apply to all portfolio areas, they are necessarily more general than the Commission's proposed rural R&D-specific principles and do not refer to the concept of additionality. In contrast, as noted above, this concept is embedded in the proposed new R&D tax incentives. Also, in their submissions to this inquiry, three State Governments that have adopted the framework principles endorsed the introduction of a set of principles focused explicitly on public funding for rural R&D.

In the light of the above, the Commission sees no reason to modify the thrust of the approach enunciated in the draft report. It reiterates that the proposed set of principles should be viewed as statements of general intent, and focused mainly on governments in the context of formulating and reviewing their rural R&D policies. The Commission sees such checks as being inherently desirable — especially given the widely acknowledged tendency for 'issues of the day' to intrude unduly on policy formulation.

However, in the light of its own further analysis and input from participants, the Commission has added a small number of principles to the list in the draft report:

- In line with a suggestion from the South Australian Government (sub. DR203, p. 5), and consistent with the rationales discussion in chapter 3, the 'contextual'

section of the principles now includes reference to the fact that public funding is not the only policy lever available to address potential under-investment in rural R&D.

- In line with a suggestion from the CSIRO (sub. DR219, p. 2), the program design-related principles now make explicit reference to the importance of facilitating collaborative research effort.
- Consistent with the RDC-specific principles (see recommendation 9.1), the Commission has added a principle dealing with the importance of facilitating future research through appropriate disclosure and dissemination of research results. Indeed, good practice in this area can also serve a broader role in helping to reinforce for primary producers the benefits of soundly-based investment in R&D.

The Commission also gave consideration to whether there is a need to define the meaning of the term 'socially valuable R&D'. As noted in chapter 3, there are various perceptions of what the term encompasses. But, in a public funding context, its meaning is straightforward — research where the collective benefit to industry stakeholders and the wider community (that is, to society) exceeds the total cost, inclusive of any public funding. In the Commission's view, elaboration of the relevant principle is therefore probably unnecessary — though there would be no reason why it could not be amended to reflect the preceding notion were this seen to be helpful.

Implementing the proposed 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 would need to occur on a cooperative basis. Accordingly, the Commission is proposing that, as a first step, the Australian Government should embody the principles 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.

RECOMMENDATION 4.1

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***
  - ***have regard to policy levers other than public funding (and any related funding instruments such as compulsory producer levies) for addressing potential under-investment in rural R&D***
  - ***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***
  - ***facilitate collaborative research effort where this would improve the quality of research outcomes or avoid wasteful duplication of research effort***
  - ***help ensure that there are 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***
  - ***facilitate future research efforts by providing for appropriate disclosure and dissemination of research results***
  - ***promote transparency in funding flows and discourage leveraging behaviour that is administratively costly relative to the benefits provided, and/or designed solely to shift costs onto other parties.***

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.***

4.2 Funding level issues

Application of the proposed public funding principles would, over time, have implications for the total amount of government funding provided for rural R&D. And, unless there were exactly offsetting changes in private funding, total expenditure levels would also be affected.

Of themselves, changes in public and total spending on rural research, up or down, should not be a cause for concern. As elaborated on below, if the rural R&D policy framework is comprehensive and soundly based, the funding outcomes that emerge from it would logically be appropriate.

Nonetheless, based on a variety of empirical work looking at the benefits of past investment in rural R&D, it is frequently argued that Australia should necessarily be spending more on such research. Indeed, as part of its terms of reference, the Commission was asked to advise on how much in total Australia should be spending on rural R&D, and what share of this spending should be funded from the public purse.

As is evident from the discussion below, these are difficult questions to answer in an abstract sense — not least because of the various empirical uncertainties involved in the postulated links between investment in R&D and improvements in the productivity of the rural sector.

More importantly, even if it could be categorically established that spending in total was too low, this would still not indicate how individual policy settings should be changed to deliver good results from a higher level of investment. Nor would it preclude the possibility that public funding for particular policy programs was too high. That is, the appropriate level of public contribution to individual rural R&D programs would still need to be judged against the public funding principles enunciated above — with particular emphasis on whether that contribution was adding genuine value as distinct from simply substituting for private funding.

The Commission has therefore concluded that seeking to supplement the proposed public funding principles with a global spending or research intensity target, or a target government share of total spending, would not be helpful. In its view, the risks that such targets would come to supplant rigorous analysis of the merits of particular policy approaches and funding programs would be considerable. As the input to this inquiry illustrates, any perception that total spending might be insufficient can quickly become an argument that all existing public funding programs should be inviolate.

The quantum

There is an extensive body of empirical work, including by the Productivity Commission, on the benefits of investment in rural R&D (see chapter 3, appendix B and PC 2007). This work strongly suggests that, in aggregate, past investments in rural R&D have provided a significant payoff both in Australia and internationally.

High past returns are of course no guarantee that future returns will be similarly beneficial.

But as several participants emphasised, the aggregate returns reported in most of the more recent studies are not greatly different from those in earlier work. Prima facie, this suggests that a higher level of investment in rural R&D (public and/or private) could provide a net gain for the community. A similar implication emerges from a recent study by Sheng, Mullen and Zhao (2010) and follow up work by Sheng, Gray and Mullen (2010), which indicates that a slowing in underlying productivity growth in Australia's broadacre rural industries since the mid-1990s can be partly attributed to a decline in (public) investment in rural R&D.

Based on this body of 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 4.2). Indeed, in its response to the Draft Report, ABARES was critical of the Commission for what it perceived as a failure to give sufficient weight to the empirical evidence in formulating its proposals for future public funding of the RDCs.

> Given this evidence, and concerns [about the Commission's assistance estimates — see chapter 6], as well as the downside risk to agriculture productivity growth and, in turn, rural communities, the case for a reduction in government expenditure on rural R&D remains weak. (sub. DR270, p. 15)

Similarly, Grain Producers Australia contended that:

> There is such an extensive body of research available in this area demonstrating almost universally positive, high rates of return for rural R&D that … it is not valid for the Commission to disregard this body of work and … then recommend Government funding to the RDCs be cut. (sub. DR205, p. 6)

For its part, the Commission readily acknowledges that the empirical work adds considerably to the various other indicators of the worth of past investments in rural R&D.

However, in its view, that empirical work cannot sensibly be a stand-alone basis for determining future rural R&D policies. There are two broad reasons for this.

Box 4.2 **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. 15–6)

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)

First, as elaborated on in appendix B, there are a range of general methodological caveats to this sort of work, with estimates of the contribution of R&D investment to productivity growth relative to other factors depending heavily on the model specifications and data sets used. More specifically, there are some significant data-related uncertainties that go the heart of the results of the recent Australian-focused studies by Sheng, Mullen and Zhao (2010) and Sheng, Gray and Mullen (2010).

- The farm survey-based data used in these studies that indicate a slowdown in trend productivity growth since the mid-1990s relate only to the broadacre

sector. In contrast, as detailed in appendix B, ABS productivity data for agriculture, forestry and fishing as a whole suggest that trend productivity growth has been much more stable over this period, with the apparent slight decline not being statistically significant at any reasonable level of certainty. The implication is seemingly that productivity outcomes in the broadacre industries over the last decade and a half may not have been representative of what has been happening across the rural sector more widely. Indeed, the farm-survey data themselves indicate that there has been considerable variability in productivity outcomes for individual broadacre industries over this period.

- Likewise, the paucity of robust data on aggregate investment in rural R&D means that it is difficult to be certain that overall public funding has fallen significantly over the period covered by the two studies. Though aggregate funding from State and Territory Governments has almost certainly declined, the trend in funding from the Australian Government is less certain — especially when account is taken of funding for rural R&D provided through climate change and other programs outside of the primary industries portfolios.
- Because of the data limitations, the studies do not take account of private investment in rural R&D and hence of the extent to which any reduction in public funding has been offset by a greater private contribution. There is some data to suggest that any such offset would not have been large, with the studies' authors also pointing to other reasons why the bias in the results from the omission of private investment may not necessarily be large (see appendix B). Even so, as explained in appendix B, it is unclear to the Commission that this issue can be quite so easily dismissed.

Thus, the Commission does not see these two studies — or the various studies that preceded them — as providing a compelling basis for concluding that Australia is significantly under-investing in rural R&D. Notably, the Commission is not alone in this regard. In commenting on these matters, Across Agriculture observed that:

> 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)

The Commission is similarly unconvinced that alternative high level metrics for assessing the adequacy of Australia's investment in rural R&D are likely to be particularly insightful. In this regard, cross country comparisons are sometimes made of countries' 'rural research intensities' — that is, their spending on rural R&D as a percentage of the value of their rural output. But here too data problems abound (see chapter 2). In addition, because of differences across countries in the industry composition of their rural sectors, there is no reason to presume that 'optimal' research intensities would be similar. That is, in countries where the rural

sector is dominated by industries that typically invest heavily in research (such as biotech and crop and veterinary chemicals), the overall research intensity should logically be higher than in countries where the sector is mainly comprised of industries whose future prospects are less dependent on R&D.

It is quite possible that some soundly based investments in rural R&D have previously 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 chapter 11).

However, the Commission has not seen evidence that it considers would substantiate the case that Australia's overall spending on rural R&D is demonstrably much lower than it should be. Nor has it seen convincing evidence that the policy framework will in future be unable to mobilise additional funding (private and public) if this were clearly required to meet emerging needs.

The latter point in turn lies at the heart of the Commission's second broad concern about the empirical studies — namely, the potential for those studies to detract from, rather than enhance, soundly-based policy making. As noted earlier, even if it could be categorically established that spending in total was too low, the empirics would provide no guidance on how individual policy settings should be changed to deliver good results from a higher level of investment. In the Commission's view, were broad targets for overall spending on rural R&D — or target research intensities — used to drive policy settings, there would be a very real risk that robust assessment of the merits of individual policies and funding programs would fall by the wayside. More specifically, a focus on increasing total spending could open the way for putting additional government money into under-performing programs, or providing incentives that made private investment in projects of low value appear to be worthwhile. In these contexts, the Commission has considerable concerns about the aspirational recommendation by the Rural Research and Development Council (2011) in its Draft National Strategic Rural Research and Development Plan, to boost public and private investment in rural RD&E, 'in order to double rural sector output over the next 30 years while consuming proportionately fewer resources'.

In sum, future rural R&D policies cannot sensibly be predicated on broad funding targets — or targets for research intensity — that are both empirically problematic and divorced from the particulars of the policy framework that determine how much funding is ultimately forthcoming from the various parties and on what sort of research it is spent. Rather, the emphasis should be on identifying what policy settings will facilitate best use of available public and private funds, and timely and effective funding responses to emerging needs. If the policy framework satisfies

these requirements, then it should, over the longer term, deliver a broadly appropriate level of R&D spending. Also, with such a framework in place, any increases in aggregate spending levels would be driven by specific needs and effectiveness and efficiency considerations as opposed to the simplistic notion that more spending in total is necessarily better than less. Notably, the limitations and risks of seeking to drive policies off broad targets were recognised by some of those responding to the finding to this effect in the draft report. (See, for example, Cotton Australia, sub. DR220 and the Grape and Wine RDC, sub. DR229.)

FINDING 4.1

Establishing broad targets for overall spending on rural R&D — or a target for rural R&D intensity — would be of little benefit, and could have significant costs were those targets used to 'drive' rural R&D policy settings. 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.

From a conceptual perspective, the appropriate overall balance between public and private funding will be dictated in the first instance by how strongly the spillover-related rationales for government to contribute to the cost of rural R&D (see chapter 3) apply to the various components of the framework.

However, as the Commission's proposed public funding principles set out above emphasise, 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 the diversion of public funding away from areas where those funds would add genuine value for the community.

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

- A significant component of public funding is currently used to support adaptive and industry-focused rural R&D that primary producers would seemingly often

have had sound financial reasons to fully 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 5).

- Government funding support for rural R&D is considerably 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.
  - Under any reasonable measurement methodology, the level of Australian Government support for the RDC program is several times greater than the assistance provided through the general R&D tax incentives (see chapter 6).

  Though the rural sector does have some distinguishing characteristics, for the reasons spelt out in chapter 6, it is not sufficiently different to warrant disparities in public funding support of these sorts of magnitudes.

The Commission further notes that there is some evidence that the public funding share for rural R&D is higher in Australia than in many other developed countries. As discussed in chapter 2, such comparisons are subject to various 'apples and pears' problems. Even so, these comparative data — and the trend in most developed countries towards a greater funding role for the private sector (see, for example, NSW Farmers' Federation, sub. 145, p. 6) — raise further questions about the appropriateness of the current public-private funding split.

Moreover, the specifics of the data aside, 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.

That said, making changes to individual public funding programs on the basis of some broad notion of how much Australian governments should be collectively contributing to rural R&D would again be a poor policy approach. Even if governments are contributing too much in total, any changes to public funding for particular programs should still be assessed with reference to program-specific benefits and costs.

Thus, at the framework-wide level, the focus should be 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 detailed program assessment should in turn be informed by the Commission's proposed public funding principles (see recommendation 4.1), with particular consideration given to the additionality requirement. This is the basis on which the Commission has put forward its suggested improvements to the RDC model (see chapters 6 to 9).

In responding to the draft report, many participants took issue with the suggestion that Australian governments are shouldering too much of the overall funding responsibility for rural R&D. Most of this argumentation was based on disagreement with the Commission's conclusion on the level of additionality attaching to public funding for the RDC program, and with its estimates of the 'per dollar' rate of assistance provided by that funding relative to the support afforded to other sectors through the R&D tax incentives. (These contentions are discussed at length in ensuing chapters.) Nonetheless, there was general agreement with the Commission's conclusion that setting an indicative target for the share of total spending on rural R&D to be collectively met by Australian governments would be a blunt, and quite possibly counterproductive, approach.

A significant number of submissions also drew attention to what was perceived to be an inconsistency in the Commission's conclusions in relation to the merits of setting broad public funding (and aggregate spending) targets, and the basis for its recommendations on future public funding for the RDCs (see chapters 7 and 8). The specific contention was that in recommending on future public funding for the RDCs, the Commission had used the sort of broad target approach that it had rejected for rural R&D as a whole. (See, for example, Joint Red Meat and Livestock RDCs, sub. DR252, p. 17).

However, the Commission sees no such inconsistency.

- Notwithstanding its judgement that, in an overall sense, governments are most probably doing too much of the 'heavy lifting', it is arguing that decisions on the appropriate level of public funding for any individual rural R&D program must be made with reference to the likely specific benefits and costs of that program. While very precise information on those benefits and costs would ideally be available, in reality, policy makers will have to deal with significant data limitations and uncertainties about what would happen in the absence of government funding. In these circumstances, less precise metrics — such as consideration of the extent to which the distinctive characteristics of the rural sector warrant a higher rate of support than is provided for similar types of R&D

undertaken in other sectors — must be used to inform judgements on appropriate levels of public funding for individual programs.

- Nonetheless, this is a quite different to setting a target for the total amount of government funding for rural R&D across all programs, and then adjusting funding for individual programs to move towards that target without any reference to the specific benefits and costs attaching to each individual program. In contrast to this sort of approach, the Commission's recommendations on future public funding for industry-focused research within the RDC program give explicit recognition to program-specific factors bearing upon that funding decision — such as imperfections in the levy regime through which producers contribute to the cost of research sponsored by the RDCs.

The Commission also disagrees with the specific changes suggested by the CRRDC (sub. DR260, pp. 5–6) to the wording of the draft finding on public funding targets and levels. In essence, these involved removing reference to the proposed public funding principles — a change which the Commission considers would fly in the face of more soundly-based future policy making. The thrust of the final finding therefore remains unchanged.

FINDING 4.2

The appropriate collective contribution by Australian governments towards the cost of rural R&D should 'emerge' from:

- *an assessment of each of the various programs through which governments currently contribute funding for such research against the public funding principles spelt out in recommendation 4.1; having particular regard to the likelihood that public funding will induce a reasonable 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 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 wasteful 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's contribution towards the cost of research sponsored by the RDCs. In particular, a range of considerations and specific evidence collectively suggest that, in an overall sense, the degree of additional research induced by government funding has been modest.
  - The industry-focused nature of the research procured by the RDCs and high estimated benefit–cost ratios suggest that, with a levy system in place, there would be strong financial incentives for producers to fully fund much of this research themselves.
  - There is a variety of evidence of such incentives at work, including the payment of levies by some industries that exceed the cap on matching government contributions, and privately funded research investments outside of the RDC model.
  - Some of the evaluation evidence compiled by the RDCs themselves is suggestive of fairly modest additionality.
- Notwithstanding the strengths of the model, such considerations raise significant question marks about the efficacy of the current public funding arrangements.

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

The ensuing discussion illustrates that the RDC model has some important strengths as a vehicle for procuring and managing rural research. Indeed, with the RDCs playing an important systems integrating role, the strengths of the model are a source of benefit in other parts of the rural R&D framework.

However, many of these strengths are not directly contingent on a contribution from the Government towards the cost of the research involved. Hence, from a public funding perspective the merits of the model must be judged against the public funding principles enunciated in the previous chapter — and, in particular, the extent to which the Government's contribution has induced additional, socially valuable, R&D. As the discussion that follows indicates, on this basis, the merits of the model as it is currently configured are less clear.

5.1 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 some of the research has contributed to better environmental and social outcomes, most of the 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 (see box 5.1).

As a basis for more precise 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).

As discussed at length in the submission from the CRRDC (sub. 128, appendix 5), the results of the latest evaluation for a 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.

Box 5.1 Examples of benefits from R&D sponsored by the RDCs

Productivity and competiveness

[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 [Sugar Yield Decline Joint Venture] project led to widespread and ongoing adoption of a package of farming practices including wider rows, permanent beds, control traffic, and legume rotations that have delivered better yields and reduced costs. (Sugar RDC, sub. 140, p. 27)

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)

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, it was put to the Commission that 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, are optimistic in the light of previous experience.[1]

As several participants emphasised, most of the benefit–cost estimates do not incorporate environmental and social benefits which have instead been handled qualitatively. 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'. Nonetheless, if these wider benefits could be quantified, they would at least partly offset the likely overstatement of the productivity-related benefit-cost component due to the factors outlined above.

The Commission emphasises that the preceding observations and the existence of some dissatisfied stakeholders (see box 5.2) do not, in its 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 the Government's contribution to the cost of that research has provided the best possible return to the community from that investment. As alluded to above, and discussed in section 5.3, this will depend critically on how much additional, socially valuable, R&D has been induced by the government contribution.

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1 As outlined in chapter 9, to guard against the potential for such 'adoption optimism' and to help inform assumptions made in future assessments, the Australian Centre for International Agricultural Research undertakes subsequent follow-up evaluations that identify actual adoption experience.

Box 5.2 **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 small number of participants were less supportive.

Several Western Australian (WA) grains interests claimed that the research sponsored by the Grains RDC (GRDC) has not delivered a benefit to grain growers commensurate with its cost. In support of this contention the Pastoralists and Graziers Association of WA (PGA) — Western Graingrowers (sub. 115) said 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 PGA Western Graingrowers — the correlation does not account for the impact of poor climatic conditions over much of the period in question.
- 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.

In the Commission's view, 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 WA share the concerns of the PGA. Indeed, while pointing to scope for improvements, the Grains Industry Association of WA (sub. 143) expressed strong overall endorsement of the GRDC.

(Continued next page)

Box 5.2 (continued)

That said, the criticism from some WA interests may suggest that the GRDC could do more to inform levy payers about the benefits of its research program. Similarly, an important component of the Australian Beef Association's critique of Meat and Livestock Australia's (MLA's) research activities related to a lack of information on the outcomes of its research programs and hence to the difficulty in establishing what benefits had ensued for which parties. While these views were disputed by MLA, the Association's concern again highlights the importance of effective dissemination of research material in sustaining the confidence of industry stakeholders in the worth of an RDC's research program.

(Others to express significant concerns about the RDC model included David Lindsay, sub. 76; Queensland Murray Darling Basin Committee, sub. 52; and Robert Ingram, sub. DR287.)

5.2 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 model. 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 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 (Grains RDC, sub. 129).

- Under the red meat industry memorandum of understanding, both LiveCorp and 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 public funds being used to support R&D of low value to industry, or the community more broadly, than under arrangements where project portfolios are driven by the skills and interests of research suppliers, or where programs are 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 involving a contribution from the public purse (chapter 2).

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 producers 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 5.3).

Box 5.3 **RDC involvement in extension activity**

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 2), 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 from participants to the effect that not all RDCs have given sufficient attention to extension matters. (See, for example, Nursery and Garden Australia, sub. 87; Irrigation Australia, sub. 90; AgriFood Skills Australia, sub. 99; and Growcom, sub. 122.) Likewise, 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).

But such concerns seemingly relate to the specific manner in which the RDC model has been applied, rather than from the fundamental characteristics of the model. And, as noted by Mallee Sustainable Farming (trans., pp. 827–836), some problems in the delivery of extension services are almost inevitable in the transition from a system dominated by public provision to one where the private sector is being called on to play a much greater role. 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 make it intrinsically better suited to promoting adoption of research outputs than some of the alternative funding and delivery approaches (see chapter 6).

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. (The discussion in box 5.2 relating to the

communication of past research results to stakeholders is germane to the former matter.) As discussed in later chapters, various improvements in these areas were suggested by participants and by some of the RDCs. Hence, 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 (see chapter 6). 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)

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:

- collaborating with other research funders to undertake rural R&D of mutual benefit to each entity's stakeholders
- using their significant financial resources to influence research priorities elsewhere in the system, including to prevent wasteful duplication of research and to help ensure that investments are of value to the relevant stakeholders. 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 5.4 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).

Box 5.4 **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, 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 investments involve 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 projects involve funding from broader government programs — such as the Climate Change Research Strategy for Primary Industries — much of the collaborative effort still appears to have a strong industry focus.

- 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. Unsurprisingly, given the need for the RDCs to cater for their industry stakeholders, much of this collaborative work has seemingly focused heavily on R&D with industry-specific objectives — a point acknowledged 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.

Further, as some participants observed, 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, and the related potential for skewing of the overall rural R&D research portfolio too far in the direction of adaptive, shorter term, research (see chapter 4), are two relevant considerations here.

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 discretionary 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.

Nonetheless, in an overall sense, the Commission sees the RDCs as having played a valuable systems integrating role which could be difficult to replicate under a different investment approach. Summarising this, 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 way, the model gives RDCs the discretion to decide when competitive tendering is likely to be beneficial. As elaborated on in chapter 6, 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 lower 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 5.5) 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 one broad feature of the RDC model that may reduce the disciplines on efficient service delivery. With the Australian Government and industry bringing roughly equal funding to the table, responsibility for monitoring the performance of the RDCs is also 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 performance outcomes than would be the case if one of the parties was responsible for providing the bulk of the funding.

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

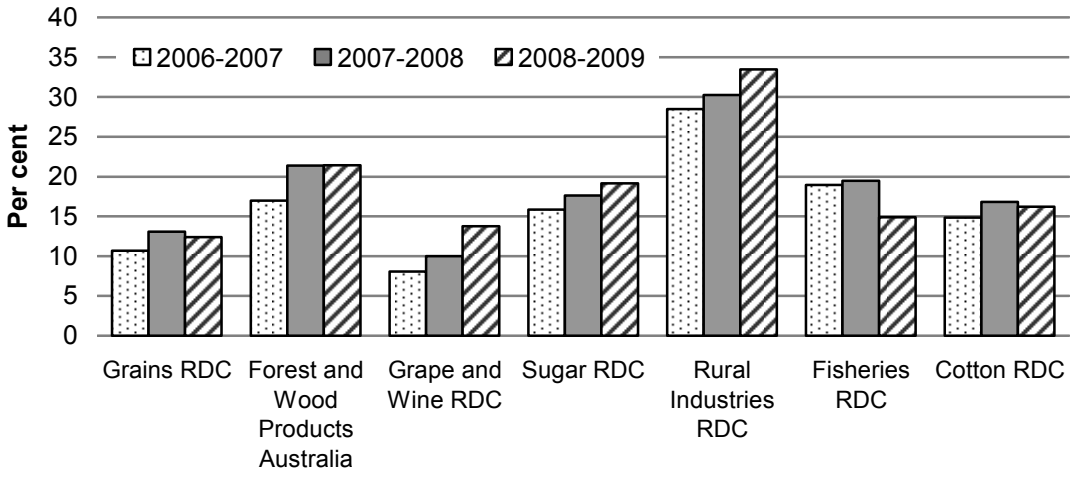
More broadly, the Commission does not see the scope for improvement in administrative efficiency — including through the important current initiatives being sponsored by the CRRDC (see chapter 9) — as detracting from the value of the expertise that has been accumulated by the RDCs in procuring and managing R&D. While such expertise is in some senses 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.

Box 5.5 **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 fell broadly within the range of 10 to 20 per cent.

RDC administrative costs[a] as a share of total expenditure



[a] 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 (pers. comm.) estimate of R&D corporate expenditure as a share of total expenditure on R&D was around 13 per cent.

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 cost shares can be heavily dependent on the methodologies used

(Continued next page)

Box 5.5 (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 have been less than half the share reported in the figure above.

As a consequence, the Commission has not predicated its considerations of administrative issues (see chapter 9) on these estimates. Rather, what is important in a forward-looking context is that the boards of each RDC are able to satisfy themselves and their key stakeholders that the overall cost structure of their respective entities is reasonable given the services provided to stakeholders and the benefits of the research that is sponsored. It will also be incumbent on boards to look for opportunities to increase administrative efficiency, including through 'collaborative' approaches such as collocation with other RDCs, sharing of information platforms and the use of standardised documentation. As discussed in chapter 9, a number of such initiatives are currently in train.

5.3 The value of public investment in the RDCs

As detailed in chapter 3, the basis 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 research investments.

However, as also discussed in that chapter, such spillovers do not automatically justify a government funding contribution. Many research 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 purpose of government funding should be to 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. In particular, significant judgement is involved in considering what part of the RDCs' research portfolios 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.

Nonetheless, there are a number of broad considerations and some specific evidence which collectively suggest that, with the levy system in place, the Government's funding contribution is likely to have induced only a modest overall amount of additional, socially valuable, research activity.

Considerations and evidence on additionality

Like any subsidy, the Government's matching contributions to the RDCs will inevitably have induced some additional research activity. And as the levy system does not completely overcome spillover-related market failures (see chapter 3), at least some of this additional research is likely to have been of net benefit to the community.[2]

Given the impossibility of observing the counterfactual, in seeking to gauge the probable extent of additionality, the Commission has sought to look in the first instance at the investment incentives that would have existed absent the matching contributions. It has then looked at various pieces of evidence of how such incentives are already influencing producer behaviour inside and outside the RDC model. Finally, it has looked at some other specific evidence, including past evaluations of individual RDC projects and general empirical work on the inducement effects of R&D support instruments, that are particularly relevant in considering the likely impact of the matching contributions on research outcomes.

Incentives for private investment

With a fully effective levy system in place, there would be sound financial reasons for producers to invest in industry-focused research even were the Government not to contribute towards the cost. Thus, in looking at the impact of the matching contribution on research outcomes, one key consideration is the extent to which the

[2] Were the levy system to be fully effective in addressing under-investment, then the implication would be that any additional research induced by the matching contribution would not be of net benefit to the community, once the costs of the subsidy were taken into account.

RDCs have been investing in research where the incentives for private investment would have been weaker.

The nature of research sponsored by the RDCs

Much of the R&D sponsored by the RDCs is applied work ostensibly directed at increasing productivity or otherwise reducing primary producers' costs (box 5.6). Also, though some of the rural R&D undertaken in Australia is 'cutting edge', a considerable portion of the domestic research effort sensibly focuses on the adaptation of knowledge, technologies and varieties developed overseas to meet particular local requirements.

Box 5.6 **The nature of the research funded by RDCs**

As several RDCs indicated, much of the research they undertake involves applying established technologies to meet particular industry requirements (see for example, Australian Pork Limited, sub. 117; MLA, 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 productivity, improved market outcomes and improved quality management (CRRDC 2010). Indeed, such a focus on research of direct benefit to industry 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 be of direct benefit to 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 above, industry-focused, adaptive, R&D supported by government funding can still be additional.

However, *with a levy system in place*, less of this sort of R&D is likely to be genuinely additional compared to, 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. While the Commission recognises that some of the industry RDCs have funded more of this broader-type research than others, the apparent under-investment in this area across

the model as a whole is one indicator that the likely amount of additional research induced by government support has been modest.[3]

High benefit–cost ratios

The high estimated returns from many RDC-sponsored projects (see section 5.1) reinforce the notion that, absent government funding, 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 5.1, there are reasons why the magnitude of these estimated returns may be overstated. Yet even if the true returns were only a half or a quarter of the reported returns, with a levy system 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.

Some participants (for example, Australian Lot Feeders Association, sub. DR207; NSW Farmers Association, sub. DR224; AgForce, sub. DR238) argued that the long lags between the conduct of research and the delivery of benefits for producers will serve to limit the incentives for private parties to invest — and by implication, would not see Government funding replaced were the current matching contribution reduced or withdrawn (see chapter 7).

However, there may well be scope for innovative producers to realise significant gains relatively quickly — as indicated by the fact that most of the project evaluations are predicated on there being some adoption within 2 to 5 years.

Limits on the leakage of benefits to other parties

If the benefits from research for producers quickly flow through to consumers, this may undermine the incentives for those producers to invest.

But there can only be rapid pass through to consumers if adoption by a significant number of producers is also rapid, with competition between those producers using the new technology then seeing cost savings passed on in the form of lower prices.

[3] Also notable in this context are the recent reductions in public funding for broader rural research within the RDC model. In particular, Land and Water Australia, which sponsored a range of broader cross-sectoral rural R&D in areas such as natural resource management, climate change and biosecurity, was abolished in 2009. And at the same time, the Government also reduced its funding to the Rural Industries RDC for research on 'national rural issues'.

While research of an 'adoptable' nature may often deliver a useable product within a relatively short period of time, as the assumptions built into the RDC evaluations reflect, widespread adoption is rarely instantaneous. Again, this suggests that there are likely to be opportunities for early innovators to secure a return from investment in productivity-focused rural research.

In addition, many Australian agricultural industries are exporters operating in markets where prices are determined internationally, rather than by domestic market conditions. As noted by Alston et al. (2004), the implication of this is that the innovating industry, and the factors of production it uses, will retain most of the benefits from the research concerned.[4] The Commission further observes that Alston et al. went on to argue that in industries where prices are determined globally, and where there is an effective levy system in place, the optimal rate of government matching contribution will be zero.

Evidence of such incentives at work

Additional levy contributions to RDCs

Reflecting the sort of incentives outlined above, several industries are contributing funds to RDCs above the matching contribution cap.

- The grains industry has endorsed a levy of 0.99 per cent of the farm gate value of production of all leviable crops (except for maize, which is set at 0.69 per cent). This levy rate generates revenues that are approximately double the level at which the matching contribution cap bites (see table 2.3).
- The wool industry has voted to pay an R&D levy equal to 1 per cent of the sale price received for shorn greasy wool — again, well above the industry's maximum matchable contribution limit.[5]
- Collectively, in 2009–10, the commercial fisheries sector contributed funds to the Fisheries RDC that exceeded the matching contribution cap applying in that sector by 40 per cent.

These 'extra' contributions are despite the government funding 'knife-edge' that exists — while there is dollar-for-dollar matching up to 0.5 per cent of an industry's

[4] Expanded domestic output made possible by cost-reducing technologies will increase the demand for other factors of production, leading to higher prices for those inputs. Also, the research-induced increase in output may see expansion of the industry into more marginal land. This will result in existing land used for the commodity concerned to increase in value.

[5] This is based on there being an understanding between AWI and wool growers at the 2009 WoolPoll that approximately half of the 2 per cent wool levy (used for sponsoring both R&D and marketing) be used for funding R&D.

gross value of production, there is no matching contribution beyond that point. To the extent that this indicates some producers are prepared to in effect fully fund 'over the odds' R&D, then a not unreasonable conclusion would be that they would also be prepared to fully fund a significant portion of research that is currently supported by the matching contribution.

Contributions outside the RDC model

There are also numerous examples of rural industries investing additional funds outside the RDC model (see box 5.7). These additional industry contributions that again do not attract a matching government contribution — or in some cases not even the generally applicable R&D tax incentives (see chapter 6) — presumably reflect the significant industry benefits from the R&D undertaken by the recipient bodies.

Indeed, it appears that in some of these industries, the effect of the matching contribution regime may be as much about determining what vehicle is used to invest in R&D, as distinct from what research is done. That is, and as discussed further in chapter 7, access to matching contributions may simply be 'pulling' research into the RDC model that would otherwise have been undertaken elsewhere. Viewed across the framework as a whole, the Commission does not consider such research to be genuinely additional.

In light of this sort of investment behaviour, the Commission is very confident that were the Government to reduce its contribution to industry-focused research within the RDC model, and especially were constraints to adjusting levy rates removed, at least part of that funding would in time be replaced by additional private contributions (see chapter 7).

Is there any specific evidence on the additionality question?

Lending further weight to the considerations above are the specific assessments of additionality in the CRRDC-coordinated evaluations of the RDCs' research activities. In the most recent assessments, 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 5.8). Indeed, only one of this subset of evaluations concluded that a program would definitely not have proceeded without the Government contribution.

Box 5.7 **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 which 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 2010, growers and millers agreed to a one-off increase in funding to BSES to ensure its continued operations.

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).

Individual private enterprises also conduct rural R&D without receiving public support other than through the generally available tax concessions. Specific examples drawn to the Commission's attention included:

- grains plant breeding, with the Grains Council of Australia — Seed Committee (sub. 45) indicating that a large proportion of such research is now done by private companies
- salmonoid farming and aquaculture
- pharmaceutical poppies
- cotton, with Cotton Australia (sub. DR220) and the Cotton RDC (sub. DR248) presenting data indicating that about 30 per cent of research is funded in this way
- wine research — by both wineries and grape producers
- meat processing.

Such research funding is more prominent amongst larger companies and in areas where there is less scope for free riding. That said, at the public hearings, PGA (trans., pp. 689–706) said that smaller grain growers in WA had directly funded on-farm innovations, as well as contributing to the work of private farmer groups (see above).

Box 5.8 **Discussion of additionality in recent project evaluations**

As noted in the text, around half of the program evaluations included in the most recent across-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)

The Commission notes that those same evaluations also 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 — government funding would be difficult to immediately replace,

especially given the cumbersome nature of the levy change process (see chapter 10). 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.

In addition, the analysis of past studies looking at the inducement effects of different forms of R&D subsidies in the Commission's 2007 report into public support for science and innovation (PC 2007, p. 743) provides some further insights on the likely additionality attaching to the matching contribution arrangements. While those studies did not cover matching contribution regimes as such, the estimated inducement effect of R&D tax concessions — also a demand-side subsidy — is relevant in this context. Notably, and consistent with some of the broad observations made above, the Commission reported that the studies, on average, suggest relatively low inducement effects.

While governments appear to have accepted that, in the light of shortcomings in alternative subsidy approaches, co-contribution schemes are nonetheless worth supporting, this does not mean that the RDC model as it is currently configured is necessarily achieving the best outcomes. Just as tax concession arrangements can potentially be modified to deliver greater additionality (see PC 2007, chapter 10), so too could the matching contribution regime be reconfigured to deliver better value for the public funding contribution (see chapters 7 and 8).

Do participants' responses to the draft report shed any new light?

The contention in the draft report that the Government's contribution to the RDC model has most probably only induced moderate amounts of additional research was widely disputed. Much of this commentary was framed against the assertion that industry would not replace government funding were a less generous matching contribution regime to apply (see chapter 7).

More generally, Grain Producers Australia (sub. DR205) and the Australian Farm Institute (sub. DR286) argued that private investment in R&D is complementary to public investment, and that by implication all research supported by public funding is additional.

Obviously, at any point in time, public and private investment in applied R&D are likely to be complementary in the sense that prudent private organisations are unlikely to invest large amounts of money in research that the Government is willing to fund. But if the research concerned is likely to be of significant benefit to private parties, then for the reasons outlined above, private parties would have strong incentives to at least partly replace any reduction in government funding. In other words, while public and private funding and investment may be complementary at a point in time, they can equally be substitutable over time.

In addition, some of the responses to the draft report were in fact supportive of the notion that currently much of the public funding is substituting for private funding. For example, the Winemakers Federation of Australia (sub. DR192) argued that if the matching contribution were reduced, there would simply be a switch to funding R&D outside the RDC regime. As alluded to earlier, any research that has simply been drawn into the RDC model by the high rate of government support is not genuinely additional.

Summing up

In helping to inform the additionality judgement, none of the broad observations or specific pieces of evidence above are individually definitive. Collectively, however, the Commission considers they strongly suggest that, with a levy system alone in place, producers would have strong financial incentives to invest in soundly based, industry-focused, research of direct benefit to them. This implies that much of the industry-focused R&D sponsored by the RDCs is unlikely to have been totally dependent on a government contribution, and in turn that public funding has subsidised a considerable amount of R&D that producers would otherwise have fully funded themselves.

In concluding that the additionality attaching to the government contribution has most probably been modest across the RDC research portfolio as a whole, the Commission is not suggesting that this is the case for every RDC. Apart from the aforementioned case of Land and Water Australia, the research sponsored by the Rural Industries RDC and the Fisheries RDC on resource management issues is almost certainly more additional than the balance of the other research sponsored by the RDCs. In saying this, 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.

However, with most of the RDCs investing primarily in industry-focused research, and with the evidence suggesting that the additionality attaching to the government

contribution for much of this research is likely to be low, the Commission's judgement is that the community is unlikely to be getting a reasonable return on its sizeable investment in the model.

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, PGA — 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.

Thus, notwithstanding the strengths of the model, as it is currently configured, there are significant question marks over its suitability as a vehicle for investing the current quantum of public funds in rural R&D. The policy implications of this broad conclusion are explored in the subsequent three chapters.

6 Reconfiguring the RDC model

Key points

- It is highly unlikely that replacing the RDC model with a completely different approach would deliver as good an outcome for the community.
  - Reallocating current government funding for 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. The need for new mechanisms to channel funds to research suppliers and the variability in departmental program management skills could further detract from outcomes.
  - 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 the core elements of the RDC model is strong, as currently configured, the model has some significant deficiencies.
  - As a considerable number of key stakeholders now recognise, the current arrangements do not cater well for broader rural research needs.
  - The level of public support provided by the matching dollar for dollar regime is several times greater than the support provided for industry-focused research in other sectors. This level is too high given the variety of evidence suggesting that much of the Government's contribution is helping to support R&D that primary producers would have had strong financial reasons to fully fund themselves.
  - Conversely, the case for some public funding support for industry-focused R&D does not evaporate once an arbitrary cap on levy contributions is reached.
- Significant changes are therefore required to:
  - provide for a more appropriate overall balance between private and public funding responsibilities
  - explicitly incentivise producers to increase their investments in the model
  - address the particular features of the current funding approach that tend to discourage investment in broader rural research.

As detailed in the previous chapter, the RDC model has some important strengths and appears to have delivered significant benefits, especially through improving the productivity of Australia's rural sector. Reflecting this, 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 requirements of both the rural sector and of the Australian Government as a major investor in rural R&D are changing, meaning that approaches which have been considered 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. Indeed, in light of the strengths of the model and the deficiencies in the potential alternatives to it, the Commission has concluded that the case for retaining core elements of the current approach is strong.

But this is not an endorsement of the status quo. The apparently modest level of additional research induced by the Government's funding contribution is reflective of some systemic shortcomings in the current model. It requires significant reconfiguration to achieve a more appropriate overall balance between private and public funding responsibilities; provide better incentives for producers to increase their investments in the model over time; and more effectively cater for broader rural research needs.

6.1 How significant are the problems in the current model?

Many of the relatively small number of more detailed shortcomings in the current RDC model could be addressed without substantially changing its nature (see chapter 9).

In addition, some of the broader criticisms of the model seem overstated. For example:

- As the discussion in chapter 5 indicates, the RDCs collaborate extensively amongst themselves and with other research funders and providers, both domestically and internationally. In fact, 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.

Box 6.1 **Participants' views on the future of the RDC model**

A few participants contended that the RDC model has significant deficiencies and should therefore 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)
>
> The lack of measurable outcomes shows there are many major shortcomings with the R&D Corporations model, particularly in relation to the arrangements that apply to the red meat industry. (Australian Beef Association, sub. 162, p. 6)

However, the 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)
>
> [B]roadly 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)
>
> [T]he 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 … 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)

- Similarly, even a cursory examination of the RDC research portfolio reveals that broader cross-sectoral research issues have not been totally ignored.
- 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 10, 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 are significant question marks over the suitability of the RDC model as it is currently configured to adequately meet some particular stakeholder requirements and to provide a return to the community commensurate with its sizeable investment in the model.

Meeting broader rural R&D needs

In the first instance, the RDC model seeks to address the research needs of individual rural industries with a particular emphasis on improving productivity. This may well involve collaborative research effort, or research which has significant environmental or social benefits as well as productivity 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 (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'.

At the same time, 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.

However, this creates 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, ensuring that the focus of the industry RDCs remained on research of direct benefit to levy payers — leaving the Government's research requirements to be separately addressed through the activities of Land and Water Australia (LWA), and some non-levy related funding for RIRDC and the Fisheries RDC (FRDC).

But with the abolition of LWA and reductions in the appropriation to RIRDC for non-industry focused R&D, together with the Government's expressed desire to see more 'cross-cutting' research undertaken by the other RDCs, the tensions in the current co-investment model have been increasingly to the fore.

As is evident from the discussion in chapter 8, there are various ways in which this tension might be resolved, entailing different degrees of change to the current model. Moreover, pressure from the Government for the RDCs to fund more cross-sectoral and other broadly-based research in return for their public funding is a relatively recent development. As several participants emphasised, project portfolios cannot be realigned overnight. There are also clearly differences across individual RDCs in the emphasis afforded to broader research issues.

Nonetheless, in the Commission's view, without substantial changes to the current configuration of the model, any attempt to achieve a sizeable shift in the overall research balance towards broader, non-industry specific, research work will most probably be ineffectual. This is because with the bulk of the Government's funding contribution bundled with levy and other industry payments, changes to the way the government contribution is spent will also affect how producers' funds are seen to be spent. In these circumstances, exhortations alone are unlikely to overcome the likely resistance from producers (and even some of the RDCs) to a diversion of their investment in the model away from industry-focused research. Reflecting this, 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)

Notably, the Commission's views on the shortcoming of the current RDC model in catering for broader rural research needs were strongly endorsed by several non-industry participants, including Irrigation Australia (sub. 90); the Australian Land Management Group (sub. 103); the Queensland Government (sub. 153); Andrew

Campbell — the former CEO of Land and Water Australia (sub. DR271); and 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).

Indeed, in responses to the draft report, a considerable number of key stakeholders acknowledged that some sort of change in this area is required — with debate centring on what specific iteration of the current model would be most appropriate (see chapter 8).

The level of the matching contribution

The most important of the Commission's proposed public funding principles (see recommendation 4.1) is that the basis for such funding should be to induce socially valuable rural R&D that would not otherwise be undertaken.

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, subsidisation of some research that would have occurred anyway is both inevitable and justified.

Nonetheless, the implication of the additionality principle is that the higher is the rate of public funding support, the greater should be its likely inducement impact. That is, given the costs of government revenue raising and the various calls on that revenue, it would be hard to justify spending very large amounts of public money supporting research that, for the most part, producers would have had sound reasons to fully fund themselves. Given its conclusion that the Government's matching dollar for dollar contributions have, to date, induced only a modest amount of additional research, the Commission considers that the case for maintaining this seemingly generous level of support is very much open to question.

That said, it is very difficult to come to judgements on what is 'large' or 'too high' without reference to the level of public support provided to other sectors. Hence, as outlined below, the Commission has sought to compare the level of assistance provided through the matching contribution arrangements with the assistance afforded through the R&D tax incentives — the main form of R&D assistance in other parts of the economy.

This is not, as some participants contended, to rely on equity or 'fairness' notions to establish future support levels. Government assistance, whatever its form, is intended to attract extra resources to the recipient industry or sector. Thus unless a highly assisted industry or sector has particular characteristics that warrant such special treatment, the resources attracted into it by virtue of that special treatment would most likely have produced greater benefit for the community had they been used elsewhere. In this economy-wide context, unwarranted disparities in R&D support have the same sorts of resource-use costs as did the previous provision of high tariff protection to many of Australia's import competing manufacturers.

Comparative average assistance levels

The principal means by which the Australian Government assists R&D outside the rural sector is through tax incentives. While it has proposed changes to these incentives (see below), they currently comprise a:

- 'basic' tax deduction of 125 per cent for eligible R&D expenditure
- 'premium' tax deduction of 175 per cent for eligible expenditure on labour and for that part of a company's claim above its average annual R&D spending in the previous 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.

At a 30 per cent company tax rate, the basic (125 per cent) tax concession equates to a subsidy of 7.5 per cent, while for the premium tax concession (175 per cent), the effective subsidy is worth 22.5 per cent. Rebasing the former in a way which allows best comparison with the matching contribution regime for the RDCs, a firm accessing the basic tax concession that spent $108 on eligible R&D, would, *by virtue of the concession alone*, see the cost of its investment reduced to $100 — a benefit of $8. For the premium tax concession, the equivalent cost saving would be $29 (table 6.1). For the reasons outlined below, these benefit figures do not take into account the standard tax deduction that the R&D investment, like other business expenses, would attract.

In comparison, matching government contributions to the industry RDCs averaged $83 per $100 of industry contributions over the period 2000-01 to 2008-09 (appendix table C.1). In other words, measured on this basis, the average rate of government contribution to the RDCs was 10.2 and 2.9 times the specific support available to non-rural industries through the basic and premium R&D tax incentives, respectively.

Table 6.1 **Comparative assistance levels**

	Government contribution per $100 of industry contribution[a]	*RDC contribution relative to tax incentive*
	$	multiple
Current R&D tax concessions		
Basic (125%)	8.11	10.2
Premium (175%)	29.03	2.9
Proposed R&D tax offsets		
Turnover ≥ $20m (133⅓%)	11.11	7.5
Turnover < $20m (150%)	17.65	4.7
Matching contributions to RDCs[b]	83	

[a] For the tax concessions and offsets, this contribution is equivalent to the reduction in the cost to a firm of an eligible investment in R&D that results from the specific tax incentive; calibrated such that the cost to the firm net of this benefit, but before making any allowance for the standard tax deduction (assumed to be 30 per cent), would be $100. For example, at the 30 per cent company tax rate, the specific benefit from the basic tax concession is equivalent to 7.5 per cent, meaning that for a gross R&D expenditure of $108.11 (100/{1-0.075}), the cost to the firm before making any allowance for the standard tax deduction would be $100. [b] Based on overall government and industry contributions to the RDCs over the period 2000-01 to 2008-09, as revised down since the draft report (see table C.1).

Source: Productivity Commission estimates.

Under the proposed changes to those tax incentives (see Treasury 2010), government support for eligible R&D would become equivalent to a tax deduction of 133⅓ per cent for entities with a turnover of $20 million and above, and 150 per cent for smaller entities.[1] This would in turn equate to a dollar subsidy calculated on the same basis as above of $11 and $18, respectively — again, very much lower than the average level of support ($83) provided over last decade by the matching government contribution arrangements for the RDCs (table 6.1).

In submissions both prior to, and in response to, the draft report, many participants contended that the measures above significantly overstate the extent of the disparity in assistance between the RDC arrangements and the tax incentives. A number provided alternative assistance measures suggestive of a much lower disparity (including, ABARES, sub. DR270; Across Agriculture, subs. 116, 163; the BDA Group, sub. DR165; and Dairy Australia, subs. 130 and DR265).

1 These new tax incentives would in fact take the form of a non-refundable tax offset of 40 per cent and a refundable tax offset of 45 per cent, respectively — or 33⅓ per cent and 50 per cent greater than the standard tax deduction of 30 per cent. Where the amount of tax owed was less than a non-refundable offset, the unused portion could be carried forward and set against a future tax liability. In contrast, the Government would pay a cash refund for the unused portion of a refundable tax offset.

The Commission has looked in detail at this input. Having done so, its considered opinion, drawing on its extensive experience in assistance measurement across all parts of the economy, is that the measurement basis outlined above is the most appropriate one; and that the alternative methodologies suggestive of a much smaller assistance disparity are demonstrably inappropriate in this particular measurement context. The Commission's reasoning is set out in detail in appendix C. However, the following is illustrative of the significant problems that attach to the 'total cost to government' approach proposed by ABARES and Dairy Australia, amongst others.

- This approach involved combining the assistance provided by the R&D tax incentives and the matching contribution with the standard tax deduction available for any business expense, including an investment in R&D. As a generally available feature of the tax system, rather than one only relating to investment in R&D, the inclusion of the standard tax deduction in the assistance calculus is immediately problematic. Moreover, its inclusion can lead to very strange assistance disparity outcomes. In particular, as detailed in appendix C, in a situation where there were no R&D tax incentives, the total cost to government approach would report assistance from the matching contribution as less than four times as generous as from the *non-existent* tax incentive.
- A number of these analyses took this combination approach even further, providing estimates that presumed primary producers would often be unable to claim the 30 cents in the dollar deduction for business expenses available to firms in other sectors. For instance, ABARES (sub. DR270, pp. 3–5), reported calculations showing that if primary producers' average marginal tax rate was 10 per cent, then the current RDC arrangements would be less generous than the current premium tax concession. As discussed in box 6.2, there is evidence to suggest that, on average, primary producers' tax rates are in fact fairly similar to the average company tax rate. But again, the Commission's main concern relates to the embellishment of an already inappropriate measurement methodology in this way. In effect, the argument underlying these estimates is that the matching contribution needs to be more generous than the R&D tax incentives to compensate for the fact that primary producers have generally low incomes and therefore get less value out of the standard tax deduction for business expenses than do enterprises in other sectors. A logical extension of this argument would be that the Government should introduce matching contribution arrangements for all types of business expenses incurred by primary producers, or any other non-tax paying entity.

Furthermore, while the Commission acknowledges that its estimates do not take account of the diversion of some of the Government's matching contributions to the RDCs into non-industry specific research, as discussed above, such 'leakage' of

government funding appears to have been relatively minor across the RDC program as a whole. Similarly, although the Commission's estimates do not take into account the potentially higher compliance and administrative costs of the RDC regime, equally, they do not make allowance for other factors that would tend to increase rather than reduce the disparities in assistance reported in table 6.1. Notable in this context is the fact that the definitions of eligible R&D under the matching contribution arrangements are considerably more liberal than the definitions that apply to the tax incentives. Also, the costs of making and substantiating R&D tax incentive claims are not trivial either.

Box 6.2 **Comparative average tax rates**

As noted in the text, some of those using the total cost to government approach to compare assistance provided by the matching contribution regime with that provided by the R&D tax incentives, contended that the value of the standard tax deduction for business expenses would most probably be lower for primary producers than for firms outside the rural sector. Were this to be the case, then within the confines of the flawed total cost to government measurement approach, the relative generosity of the matching contribution regime would be further reduced.

However, the validity of the contention that primary producers are likely to derive less benefit from the standard tax deduction for business expenses is open to question.

- ATO (2010) data indicate that, over the five-year period 2003-04 to 2007-08, average effective tax rates for corporate agricultural entities, individual farm entities (inclusive of both farm and non-farm income), and non-rural corporate entities were 26 cents, 28 cents and 25 cents in the dollar, respectively.
- ABARES (2010) farm survey data indicate that, over the decade to 2008-09, for establishments accounting for 98 per cent of the value of broadacre output, {farm cash income + build up in trading stocks – depreciation} averaged a little over $40 000 a year. (Importantly, the farm cash income measure is net of 'cash' costs including interest payments.) For a non-corporate entity, this rough proxy for taxable income would translate to a marginal tax rate of 30 cents in the dollar, the same as the company tax rate.

Such data serve to further highlight that the assistance estimates derived from the total cost to government methodology are misleading and therefore of no relevance to the policy issues at hand in this inquiry.

The preceding commentary is not to suggest that the Commission's assistance estimates provide a ready-made basis for determining future funding for industry-focused R&D sponsored by the RDCs. Like the studies that attempt to quantify the impacts of R&D spending on the rural sector's productivity (see chapter 4), summary indicators of comparative R&D assistance must be interpreted carefully and do not obviate the need for judgement on funding matters. A particular issue

here is that once the cap on the matching government contribution is reached, there is no public support provided for additional levy or other industry contributions (see later).

Nonetheless, in the Commission's view, the fundamental conclusion emerging from the preceding discussion — namely that, in overall terms, the matching contribution regime has provided support several times greater than the R&D tax incentives — cannot reasonably be disputed. Indeed, measurement metrics aside, the decisions by some producers and industries on whether to invest in research through the RDC model, or through other vehicles, are strongly suggestive of a material disparity in support levels. In commenting on the impacts of a cut in the matching contribution (see chapter 7), several industry participants suggested that while much of the current R&D program would continue, a greater proportion of that research would be undertaken outside of the model. The implication is that, for this research at least, current usage of the model is because of the higher level of government assistance available.

Can the current disparity in support be justified?

In the Commission's view, the seemingly modest amount of additional R&D induced by the Government's contribution to the RDCs, together with the relative generosity of that support, strongly suggest that the future level of public funding for the model should be lower.

However, it recognises that its conclusions on the inducement effect of the matching contribution are not shared by the large majority of industry participants (see chapter 7). It also recognises that the inducement effects of the basic 125 per cent tax incentive in particular are unlikely to be especially large either (see PC 2007, section 10.4).

Accordingly, as a further check, the Commission has drawn on the assistance estimates in a more inferential way. Specifically, it has considered whether the rural sector has characteristics which suggest that public support could have a higher inducement effect than in other sectors, and that therefore maintenance of some or all of the current assistance disparity is warranted.

Characteristics of rural industries

Rural industries are often portrayed as comprising many small enterprises that use similar, readily-observable, production methods. The argument then follows that these characteristics make it particularly likely that rural industries will under-invest in R&D because:

- in industries dominated by small enterprises, the amount of funding required for viable research will often be beyond the financial means of individual producers
- ready scope to observe and copy production innovations will reduce the likely returns that innovators can expect to enjoy from their investments.

But this general characterisation of the rural sector and, more particularly, the strength of the conclusions drawn from it are, in the Commission's view, debatable.

- Not all industries covered by the RDC arrangements are dominated by smaller enterprises. The forestry and meat processing industries, for example, mainly comprise large enterprises that potentially have sufficient scale to recoup the cost of sizeable R&D projects and, in some cases, protect the intellectual property ensuing from innovative activity. 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 R&D outside of the RDC arrangements (see Corporate Agriculture Group, sub. 134).
- Disincentives for investment stemming from smallness and the scope for free-riding can be at least partly addressed by the sort of producer levies that provide the bulk of the industry contributions to the RDCs. Moreover, the common contention that new innovations in the rural sector are often adopted quite slowly, calls into question the magnitude of the free-rider problem. That is, other things equal, the slower the rate of general adoption, the greater will be the returns to the innovator from an investment in R&D (see chapter 3).

The Commission readily acknowledges that the levy system will not fully overcome the free-rider problem. This suggests that some public funding contribution is warranted for industry-focused research.

Also, in the particular case of commercial fishing, a significant part of the industry research sponsored by the FRDC is directed at supporting the Government's broader role in managing a 'common property resource'. As the current arrangements reflect, this justifies a significantly higher rate of government contribution than is provided to the other industry RDCs. (Specifically, while FRDC's matching government contribution is capped at 0.25 per cent of fisheries GVP, it receives an additional amount equivalent to 0.50 per cent of GVP not linked to industry payments.)

However, fisheries aside, the Commission does not see the characteristics of rural industries as giving rise to an in-principle argument for public support for industry-

focused research sponsored by the RDCs that is several times higher than the support provided for comparable research in other sectors.[2]

Spillover benefits from rural R&D

Another in-principle argument put forward to justify a relatively 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.

Yet spillovers from industry-related research are hardly unique to the rural sector. Many technologies can, with relatively minimal adoption, be applied across industries and, in areas like drug research, the benefits from successful research can be enormous for the community as well as for the successful innovator.

More importantly, beneficial spillovers do not necessarily deter investment in R&D (chapter 3). If the return that an innovator receives is sufficient to justify an investment, then any associated spillovers to other parties are not a reason for the government to contribute to the cost of the investment. As detailed in chapter 5, a range of factors collectively suggest that primary producers would have had sound financial reasons to fund much of the research that has previously been sponsored by the industry RDCs.

Rural industries do frequently make greater direct use of natural resources than other sectors, and so it could be argued that rural R&D has the potential to generate 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.

But as noted in chapter 3, primary producers will sometimes have a strong incentive to fund R&D that improves environmental outcomes. For example, producers can directly benefit from innovations that conserve water and decrease soil erosion — and, depending on the regulations that are in place, they may also have incentives to invest in research explicitly directed at reducing their environmental footprint. Even

[2] While a few other industries — notably motor vehicles and textiles, clothing and footwear — also receive a high rate of assistance for their R&D, these assistance rates are not an appropriate benchmark against which to assess public support for industry-focused research within the RDC model. 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).

where government subsidies are the most effective means of catering for community-wide spillovers, channelling those subsidies through entities concentrating mainly on industry-focused research is not necessarily the best approach (see chapter 8).

What does this all mean?

The preceding analysis of the characteristics of the rural sector reinforces the conclusions that emerge from the Commission's assessment of the likely degree of additionality in the industry-focused research that has been funded through the RDC arrangements. In its view, the clear implication is that the level of public support provided for this particular component of the overall rural R&D research effort is too high.

Even if the arguments that the totality of Australia's spending on rural R&D is too low (see chapter 4) were to be accepted, it does not follow that the Government should in consequence maintain or increase its funding for industry-focused research sponsored by the RDCs. To reiterate, each individual program must be judged on its merits with government funding levels adjusted if that funding is not adding commensurate value for the wider community.

This does not mean that there should be no allowance made in public funding programs, including the RDC regime, for the rural sector's distinguishing characteristics. The very existence of the levy system is recognition that the sector is somewhat different from other parts of the economy. Nor does it mean that the consideration of future public funding levels for the RDCs should ignore the opportunities that may exist to increase the degree of additionality attaching to their industry-focused research. Thus, as discussed in chapter 9, a requirement for industry RDCs to demonstrate that they have undertaken a reasonable amount of longer term/larger scale/higher risk research could promote greater research additionality without the need for the Government to involve itself more directly in project selection. Here again, policy decisions regarding future funding levels should reflect such opportunities and requirements.

It is also important to recognise that the Commission's general conclusion applies only to industry-focused research sponsored by the RDCs (other than the fisheries-specific, natural resource management, research funded by the FRDC). For cross-sectoral and other broader rural research sponsored through the model, a higher rate of public subsidy may often be warranted.

However, as alluded to above, a considerable number of key stakeholders accept that public funding for such broader research within the model should, in one way

or another, be managed separately from public funding for industry-focused R&D. With specific new arrangements in place to achieve this (see chapter 8), the case for levy payers and other private parties to gradually take on greater responsibility for funding the industry-focused research component would become compelling.

Placing progressively greater responsibility on levy payers and other private parties to fund industry-focused research within the RDC model would be consistent with the intended outcome when the model was introduced. At the time, the Government (Brown 1989, p. 1403) said that it expected the RDCs to demonstrate the benefits of increased R&D funding and that its funding contribution 'should ideally be seen as seed money to encourage industry contributions'. Similar sentiments were expressed by the relevant Ministers prior to the drafting of the enabling legislation (Kerin and Cook 1989). A greater funding role for levy payers would also be in line with the general trend in developed countries towards increased private sector funding of rural R&D as a whole (see chapter 2).

The configuration of the matching contribution

A further important consideration in looking at the appropriateness of current public funding support for industry-focused research within the RDC model is that there can be a major difference between the average and marginal level of support.

Specifically, where revenue from industry levies (and other forms of industry contribution) is less than the cap on the matching government contribution, the marginal and average levels of public support are the same (dollar for dollar). But where industry contributions exceed the cap, there is no public support for the above-cap component, meaning that the average level of assistance for the RDC/industry concerned falls below one for one. Reflecting this, total government contributions for entities such as the Grains RDC and Australian Wool Innovation have been considerably less than one for one (see table 2.3). Likewise, it is the reason why the average level of government contribution across the whole of the RDC program over the last decade has been somewhat less than one for one (83 cents per dollar of industry contribution).

The current cap might be conceptually appropriate if it could be established that the rate of inducement of additional, socially valuable, research declined significantly around the level of expenditure at which contributions ceased to be matched. However, there is no practical basis for determining whether this is the case. Further, even if it were to be true in aggregate, the situation would almost certainly vary across industries. Hence, as the Industry Commission (1995, p. 754) observed, any cap will be arbitrary.

At the time the RDC regime was introduced, the matching contribution cap may have represented more of an 'aspirational' target than a practical constraint on the amount of public funding support available and thereby an impediment to incentivising additional industry contributions. Even now, the existence of substantial above-cap levy contributions in some industries might be taken as evidence that the cap has not significantly influenced the behaviour of producers and the research outcomes that have ensued. Moreover, as alluded to above, for some industries contributing at around the level of the cap, there has been additional research funded by private contributions outside of the model — with that incremental research at least partially supported from the public purse through the tax incentives. (The Cotton, Wine, Fishing and Sugar industries are cases in point.)

But as discussed in section 6.2 below, the option of accessing support through the R&D tax incentives is not available to many smaller primary producers. More generally, the Commission's strong impression is that, in at least some industries, the matching contribution cap has established a 'mindset' benchmark for the optimal level of spending by primary producers on rural R&D which is both arbitrary and unchanging. As a representative from the Red Meat and Livestock RDCs observed at the public hearings:

> I think there's a cultural inclination in our industry that has locked us in quite successfully for a long, long time, 0.5 GVP, and the industry happily stumps up with its 92 cents in beef and a corresponding percentage in sheep meats. It's just a cultural expectation and historical standards which are pretty strongly ingrained. (trans., p. 824)

Even in the grains industry — which accounts for the bulk of the above-cap levy contributions — levy rates have not changed for more than a decade. Hence, the current cap arrangement has seemingly provided little encouragement for grain growers to periodically reassess whether their levy contributions remain appropriate in the light of changing industry circumstances.

The Commission therefore considers that the arbitrary cut-off in public funding support for industry-focused research is a significant deficiency in the current RDC arrangements. Notably, it is a design feature that stands in contrast to the uncapped nature of support provided to other sectors through the R&D tax incentives.

The Commission acknowledges that this aspect of the matching contribution regime received little explicit treatment in the draft report, meaning that the proposal for remedying the defect (see chapter 7) has not been directly tested with stakeholders. Equally, the underlying issue of the lack of incentives for producers to maintain or increase their funding contributions to the RDCs was extensively canvassed in responses to the draft report and in discussions at the public hearings. For example, the Tasmanian Institute of Agricultural Research observed that:

> The conclusion that industry needs to increase its contribution to RD&E is supported. However, neither the incentive to do so, nor the mechanism to do so are clear and will require further attention. (sub. DR213, p. 2)

Suffice to say it is a design fault which the Commission now strongly believes should be addressed.

6.2 How do the alternatives measure up?

The preceding high level shortcomings in the current matching contribution arrangements are not of themselves sufficient or even good reasons to abandon the RDC model. As discussed in chapter 7, the Commission's concerns about both the level and configuration of the matching government contribution can be readily addressed within the confines of the current co-investment approach. And though addressing the issues related to the funding of broader research require somewhat greater changes, many of the elements and thereby the strengths of the current RDC model can still be preserved (see chapter 8).

Nonetheless, in accordance with its terms of reference and good policy assessment practice, the Commission considered whether dispensing with the RDC model and instead investing the Government's current contribution to the model in other ways, could deliver a better outcome for the community. As the ensuing discussion makes clear, it is highly unlikely that this would, in fact, be the case.

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 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.
- Likewise, less direct producer input, and reduced connectivity with extension services, would most probably result in slower uptake of research outputs — further diminishing the worth of those outputs for the community.
- There would be a 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. 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 detract from the effectiveness of research outcomes. It could also 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 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 Australian Wool Innovation as on the intrinsic merits of the approach.

Reallocating the government contribution to departmental programs

The Commission similarly 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 funding. 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.

But the approach would also have some potentially 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. 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, slow and costly for those seeking 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.

Reflecting on its experiences, Birchip Cropping Group said that:

> [For] some of the national land care programs, the administration burden and the reporting required is often excessive in relation to the scale of dollars that comes through, particularly in comparison to RDCs and the philanthropic sector and their requirements for reporting. The time frame of application to notification, to contracts, to implementation will often mean that you are naturally placed one season behind where you could have been. So that nimbleness of actually responding to funding submissions and making decisions quickly enough to actually do the work as the time is appropriate has been a challenge with state and federal sources. (trans., pp. 841–2)

In addition, 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 5, 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. 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. 414–21).

During discussions, the Commission received some favourable input on the research management skills available in parts of government, especially at the State and Territory level. Equally, there were many concerns raised about these skills — and more particularly about the related incentive structures. For example:

- 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'.
- The Commission was told several times that proposals for research funding have sometimes been framed to appear to conform with climate change objectives even when the funding programs concerned do 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. But the most damning indictment came from Andrew Campbell in commenting on the difficulties of achieving effective research

management within the Australian Government — the comparator most relevant in the case of the RDCs.

> Policy Departments operating under the [Financial Management and Accountability] Act generally suffer from a number of constraints in delivering research management services, including that they:
>
> - perform a wide range of roles other than research management, many of which impose more urgent daily requirements and deadlines
> - are subject to the FMA Act, which (compared with the CAC Act) places restrictions on the management of multi-year funding and partnering with commercial organisations
> - have a high level of staff turnover (compared with most research providers and dedicated research funding organisations) which undermines continuity, cohesion, credibility and corporate memory
> - find it difficult to train and retain sufficient staff in research or knowledge management roles
> - lack specialised project and contract management systems designed for managing research activities …
> - tend to use generic professional services contracts to procure research (rather than contracts designed specifically for the purpose of research investment)
> - lack dedicated outreach systems to communicate and promote research outputs (beyond passive communication mechanisms such as press releases), and have difficulties with publishing findings that are inconsistent with the policies and priorities of the government of the day
> - find it difficult to manage knowledge legacy issues, especially after the funding period for the relevant project or program has ended. … Their evaluation processes tend to be oriented to accountability within particular programs, rather than adaptive learning across a whole portfolio through time. (sub. DR271, p. 15)

Though the Commission does not necessarily endorse all of the preceding specific criticisms, taken in the broad, they suggest 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.[3]

Relying on the general R&D tax incentives

Perhaps the most fundamental change in approach would involve retaining the levy system, but ending the matching government contribution and instead giving

[3] A number of the preceding observations would also be relevant to the further option of allocating all of the Government's current funding for the RDCs to contestable grants programs run by bodies such as the Australian Research Council. That said, some participants canvassed the possibility of using this approach to cater for any pure 'public good' rural research that is currently pursued within the RDC model (see chapter 8).

primary producers access to the general R&D tax incentives for their levy payments. A similar approach is used to fund coal research (see sub. 56).[4]

A key effect of the approach would be to notionally 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 support that, in overall terms, is several times greater than the support provided through the R&D tax incentives (see section 6.1).

At face value, any change that reduced disparities in levels of assistance for R&D across the economy could have some efficiency benefits. In particular, under the tax incentive approach there would be less government funding expended on supporting rural research that levy payers would seemingly often have had sound financial reasons to fully fund themselves.

However, other considerations militate against using the approach.

- As discussed in section 6.1, the nature of the rural sector and rural research, in combination with imperfections in the levy system as a means to overcome free-rider problems, may provide a basis for *somewhat* higher public support for industry-focused R&D than in other parts of the economy.
- While the tax incentives are accessed by some private parties investing in rural research, as several participants pointed out, those incentives are 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 incentive 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 4), DAFF (sub. 156, pp. 40–1) observed that the general definitions of eligible R&D for tax incentive purposes are more stringent than those for expenditures which qualify for matching government contributions under the RDC arrangements.
- Even with changes to improve the access of primary producers to the tax incentives, the immediate — and in the Commission's view — large reduction in government support that the approach would entail would be highly problematic on transitional grounds.

[4] At present, while levy payments are a deductible business expense, they are generally excluded from the tax incentives. 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.

It would be possible to address all of these issues through introducing a rural-specific R&D tax incentive — a suggestion made by a few participants (for example, subs. 17 and 115). But this would call into question the primary basis for moving to a tax incentive approach — namely equality of treatment with other sectors.

Also, the current government contribution to the RDCs is partly intended to facilitate non-industry focused rural R&D. A general, non-prescriptive, tax incentive for rural R&D spending, no matter how big, would not do this. Thus, even putting aside all of the other problems, the tax incentive 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 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, the case for retaining core elements of the RDC model is strong.

That said, as the RDC model is currently configured, the Commission considers that it is unlikely that the very sizeable government contribution is buying a significant amount of additional, socially valuable, R&D. Rather, a variety of indicators collectively suggest that the bulk of that contribution has been helping to fund the sort of research that producers (collectively or individually) would often have had sound financial reasons to fully fund themselves.

Research supported by the government contribution that is not additional may still be advantageous for the community in the sense that the total benefit exceeds the total cost. Indeed, for research that producers would otherwise have had sound financial reasons to fully fund themselves, this will usually be the case.

However, the Commission reiterates that raising government revenue has both administrative and wider efficiency costs. Thus, where government funding simply replaces some private funding without changing what research is done, even though the research may be socially valuable, the community is in overall terms still made worse off. Though there is some scope to sensibly increase the additionality of the industry-focused research sponsored through the RDC model (see chapter 9), the extent of the collective increase across all RDCs is unlikely to be large. In the

Commission' view, maintaining the current very high level of government funding support for this research cannot therefore be justified.

The previous considerations do not of course provide a ready-made answer on precisely by how much the level of government support for industry-focused research within the model should be reduced. Equivalence with other sectors is not automatically the right answer. While the distinctive characteristics of the rural sector do not warrant the current disparity in assistance levels, in the Commission's judgement, some degree of 'loading' is probably warranted. A key consideration here is the aforementioned deficiencies in the levy system as a means to address free-rider problems that may lead to underinvestment in industry-focused rural R&D (see chapter 3). Also, the usual sorts of adjustment considerations will constrain the pace at which the level of government support can sensibly be reduced and the total reduction in support which would be prudent before there is a further review.

The second major change required to the current arrangements is to introduce some sort of uncapped incentive for producers to increase their investments in the RDC model. The case for at least some public funding support for industry-focused rural R&D does not evaporate once an arbitrary level of industry investment is reached. In addition**,** this cut-off point for public support sets an unhelpful defacto benchmark for the appropriate level of industry contribution that has no linkage to the benefits and costs of the research opportunities that are, or may become, available. Notably, the current knife-edge arrangement stands in contrast to the uncapped nature of the R&D tax incentives.

Finally, significant changes are required to the way in which government funding for broader rural research within the RDC model is provided. While there is no bright dividing line between such broader research and research focused explicitly on enhancing the productivity of producers in particular industries, where the bulk of research benefits are likely to be non-industry specific, the case for public funding support will often be strong.

Despite continued exhortations from the Government, shifting the research focus of the industry RDCs has not proved easy. And this is likely to remain the case if the Government's funding for broader research within the model continues to be bundled with its support for industry-focused research. Thus, as a considerable number of the key stakeholders now acknowledge, some sort of change in funding arrangements to address this problem is required.

Reflecting the above, the Commission's funding reforms for the RDC model have three broad planks.

- Levy payers and other industry stakeholders should gradually take on greater responsibility for funding industry-focused research sponsored through the model.
- At the same time, there should be some uncapped, publicly-funded, incentive for industries to increase their investment in the model over time.
- The Government's contribution for broader rural R&D should in some way be managed separately from its contribution for industry focused-research that is linked to levy and other industry payments.

The Commission's specific funding proposals are set out in the following two chapters.

7 Future funding of the industry RDCs

Key points

- Two key changes are required to the funding arrangements for industry-focused research within the RDC model.
  - Producers should be required to gradually take on greater funding responsibility.
  - The absence of an explicit public funding incentive for producers to increase their investment in the model over time should be rectified.
- Many of the specific arguments put forward in response to the draft report as to why there should be no reduction in current levels of public support are not well founded.
  - The general perception that policy should be dictated by what would happen to total funding for rural R&D is also misplaced. Outcomes for the community do not depend simply on whether there is more or less investment in such research.
- However, the responses to the draft report have highlighted the uncertainties that surround the likely response of levy payers to a reduction in government funding — especially if those reductions were introduced in a precipitate way.
- Also, the role and uptake of the proposed uncapped 'second tier' subsidy to help incentivise additional industry contributions should not be undermined by too large a reduction in total government funding support in the short to medium term.
  - Accordingly, the Commission's revised recommendations would involve a smaller reduction in total government funding for industry-focused R&D than those in the draft report.
- Specifically, the Commission is recommending that:
  - the cap on the matching dollar for dollar contribution be gradually reduced over ten years from 0.5 to 0.25 per cent of an industry's gross value of output
  - there be an immediately available 20 cent in the dollar subsidy for eligible industry contributions above the applicable dollar for dollar cap
  - the nature of the future matching contribution arrangements for very small rural industries should be the subject of further consultation between the Department of Agriculture, Fisheries and Forestry and the other stakeholders concerned.
- With no change in levy rates, and at current industry production values, the reduction in annual government funding resulting from these changes would be around $75 million to $80 million a year at the end of the ten-year phase-in. But if producers responded to the new second tier subsidy by increasing their contributions, that reduction could be considerably less.
  - There would also be new public funding for Rural Research Australia (chapter 8).

As detailed in the previous chapter, the Commission has concluded that the RDC model should be retained, but that changes should be made to the way in which government funding for both industry-focused and broader rural research within the model is provided. This chapter sets out the Commission's recommendations on the industry-focused component of that funding.

A central underpinning for these recommendations is that levy payers and other industry stakeholders should gradually take on greater responsibility for funding industry-focused research sponsored through the model. In the Commission's view, the bulk of the Government's present dollar for dollar matching contributions are being used to fund projects that producers would have had sound financial reasons to fully fund themselves. While the same is possibly also the case for some comparable research in other sectors that is supported through the R&D tax incentives, the rate of that support is much lower. As outlined in the previous chapter and elaborated on in appendix C, under any reasonable assistance measurement methodology, the average level of support provided through the matching contribution regime has been several times greater than that available through the current (or proposed) tax incentive arrangements.

That said, coming to judgement on the degree to which the level of funding support for industry-focused research sponsored by the RDCs should be reduced — or the timeframe over which such reductions should occur — is no easy matter.

- As spelt out in the previous chapter, there is a case for a somewhat higher level of public funding support for industry-focused research in the rural sector than would be appropriate for comparable research in most other parts of the economy.
- Through the creation of Rural Research Australia (RRA), the Commission is recommending that the Government's contribution for broader rural R&D within the model be uncoupled from its funding of industry-focused research (see chapter 8). This would leave the existing RDCs free to concentrate predominantly on sponsoring research aimed at providing a direct and commensurate financial benefit for their producer constituents. To the extent that some of the current government (and industry) contributions to these RDCs have been used to fund broader research, then the creation of RRA should permit a greater reduction in their public funding than would otherwise have been the case.[1]

[1] The same sort of argument would still apply if, as an alternative to RRA, all of the existing RDCs received a part of their public funding as an earmarked contribution for broader research (see chapter 8). That is, with such an earmarked contribution, public funding for the industry-focused component would no longer need to include any 'weighting' to reflect broader research responsibilities.

- There is necessarily uncertainty about precisely how levy payers will react to any reductions in public funding support, especially in the shorter term. Although such support in this or other sectors cannot be, and should not be, premised on government offsetting poor decision-making by private parties, the way in which changes are introduced should not involve excessive risk to the achievement of the intended end point — or to general research capacity within the broader rural R&D framework.
- Funding arrangements for industry-focused research within the model cannot sensibly be determined completely in isolation from what is happening on the funding front elsewhere in the broader framework. Nor can they disregard the time and cost involved for industries seeking to contribute more for R&D through the levy arrangements.

There is also the further complication of the need to address the deficiency in the configuration of the current matching contribution arrangement — the second key plank in the Commission's proposed regime for future government funding of the RDC program. At the moment, once levy (and other eligible industry) contributions reach the matching cap, any additional industry contributions attract no public funding support. As detailed in the previous chapter, the case for at least some support does not evaporate once an arbitrary cap on industry contributions is reached.

Providing an uncapped incentive for producers to increase their contributions to the RDCs will obviously have a budgetary cost. Though the Commission sees such an incentive as being inherently desirable, the amount of additional public funding that is likely to be involved cannot be completely divorced from the high level considerations suggesting that in overall terms, government support for industry-focused R&D within the model is currently too high. A delicate balancing act is therefore involved.

Against this backdrop, and in the light of responses to the draft report, the Commission has significantly modified its suggested funding approach for this component of the model. It considers that its revised recommendation would address some legitimate concerns about, and omissions in, the draft report proposal, while still ensuring that taxpayers are not unreasonably burdened with funding responsibilities that more appropriately lie with the rural industries concerned.

7.1 The draft report funding proposal

In keeping with the discussion above and in chapter 6, the proposal in the draft report for the future funding of the industry RDCs was underpinned by the notion

that the current level of government support should be reduced — but to a level still above that provided through the generally available tax incentives. The Commission further emphasised that this reduction in support should occur gradually so as to avoid high adjustment costs, observing that:

- If support were to be reduced too rapidly, there would be a risk that producers could respond by significantly reducing their levy and other contributions, despite evidence that they receive high returns from the R&D funded by those contributions. Hence, the stability of the whole RDC model might be threatened.
- Even without this sort of response by producers, a significant and immediate reduction in public funding might still lead to a loss of human capital and expertise in the research community, which would take a long time to restore.
- Reducing government support for the industry RDCs would add to the adjustment pressures arising from other contemporary funding developments — including the ongoing pressures on State and Territory governments to contain the costs of their rural R&D programs; and the possibility that it may become more difficult to secure funding for rural R&D under the cooperative research centres program (chapter 2).

In determining by how much current government funding for the industry RDCs should be reduced, the Commission noted that the conceptually precise approach canvassed in its 2007 study of public support for science and innovation (see box 7.1), would most likely be very difficult to implement. It therefore concluded that the use of more approximate metrics and benchmarks — and, in particular, cross-sectoral comparisons of support for broadly equivalent types of research — are the only practical means to inform judgements in this area.

To minimise the extent of change, the Commission also sought to frame the draft report proposal within the confines of the current matching contribution regime. Thus it did not canvass the option of complementing the capped dollar for dollar matching contribution arrangements with an uncapped, lower rate, 'second tier' subsidy. As alluded to above and elaborated on below, the input from participants in response to the draft report and its own further thinking on this matter, have led the Commission to now conclude that a second tier subsidy would in fact be highly desirable.

In light of all of the above, the draft report proposal specifically provided for a gradual reduction over ten years in the cap on matching government contributions to the industry RDCs from 0.50 per cent to 0.25 per cent of an industry's Gross Value of Production (GVP). The Commission noted that because there is already a GVP-based cap of 0.25 per cent on matching government contributions to the Fisheries RDC (FRDC), that part of the FRDC's research directed at enhancing the productivity of specific fishing industries would be unaffected by this change. (As

discussed in chapter 8, the Commission is also proposing that the unmatched government funding provided to the FRDC for its broader natural resource management research be continued.)

Box 7.1 **Calibrating government funding levels**

In its study on public support for science and innovation (PC 2007), as in this inquiry, the Commission concluded that funding for the industry RDCs should be reduced. However, it went on to suggest that the extent of this reduction would best be determined on a RDC-specific basis, drawing on assessments of the spillovers induced by past public support for each entity's research program.

As discussed in chapter 5, the RDCs have since participated in a program-wide series of *ex post* evaluations of their R&D investments (CRRDC 2010). This has highlighted the difficulties of putting even rough orders of magnitude on spillover benefits — particularly those of an environmental or social nature — let alone distinguishing between those attributable to government funding and those that 'incidentally' attach to privately profitable research. Moreover, it seems unlikely that the underlying methodological issues will be easy to resolve.

Also, in the unlikely event that robust estimates of these induced spillovers could be computed, they would most likely vary both across the RDCs and over time. Therefore any attempt to link government funding support to such estimates could result in a complex array of industry-specific matching contributions, and involve ongoing uncertainty about future levels of public support.

As discussed in the text, the Commission has therefore employed more approximate metrics to inform its judgements on appropriate future government funding for the industry RDCs. In this regard, it rejects the notion put by the Rural Industries RDC (RIRDC; sub. DR275) that this constitutes an 'ironical' abandonment of an evidence-based approach. As RIRDC also acknowledged, the current program-wide evaluation work is incremental and remains developmental. In these circumstances, it is perfectly reasonable to inform judgements in other ways. In any event, better evidence on induced spillovers from past research would not obviate the need for judgement about the likely spillovers from prospective research — or in regard to the tradeoff that exists between the potential benefits of more precise targeting of public funding support across individual RDCs and the costs of the resultant greater complexity in the subsidy regime.

The Commission further indicated that special arrangements were warranted for smaller rural industries falling within the RIRDC umbrella to help ensure that a reasonable amount of funding is available to meet their research needs. To this end, and in contrast to the recommended halving of the general contribution cap, it proposed that for the often small industries that make voluntary contributions to RIRDC, the Corporation's current practice of using a part of its appropriation from the Government to match these contributions up to a cap of $300 000 a year should be continued.

In commenting on the funding impacts of these proposals, the Commission observed that government support for industry-focused research sponsored through the RDC arrangements would still be considerably higher than elsewhere in the economy. (Using the methodology described in chapter 6 and appendix C, had the matching government contributions to the industry RDCs been halved in 2008-09, the average level of assistance provided would have been between 1.5 and 5.1 times the rate of support offered under the current R&D tax incentives; and more than twice the rate of support under the proposed new tax incentives for companies with a turnover of up to $20 million a year.)

The Commission also pointed out that the progressive build up of government funding for RRA (see chapter 8) — would partly offset the estimated reduction in public funding for the industry RDCs of some $110 million a year (based on current industry output and levy contribution rates) at the end of the suggested 10-year phasing period.

The Commission acknowledged that this funding reduction would not be welcome. However, it went on to argue that:

- given the significant benefits that productivity-focused rural R&D can have for primary producers' 'bottom lines', there would be a strong commercial incentive for them to fill at least part of the funding gap
- the change in total public funding is not a good indicator of how the wellbeing of the community would be affected, and that large subsidies for research that producers would often have sound financial reasons to fully fund themselves is no less wasteful and costly than other instances of poorly targeted public spending.

7.2 Responses to the draft report

A few participants accepted that there was a legitimate argument to reduce the cap on dollar for dollar matching contributions from the Government. For example, the Environmental Farmers Network said that:

> On balance the proposal to reduce the Government contributions to [0.25 of GVP] in a staged manner is acceptable given that an additional body is recommended to be funded to conduct research on broader environmental and social issues affecting our sustainability. (sub. DR190, p. 1)

Robert Ingram (sub. DR287) — a primary producer with farming experience in both Australia and overseas — observed that a halving of the cap would serve to level the playing field with other sectors. That said, he went on to contend that the co-investment approach substantively negates incentives for private investment in rural

R&D and that all government funding for the RDCs should be withdrawn — with any genuine market failures addressed through the research grants programs that are accessible to all Australian businesses.

The PGA – Western Graingrowers (sub. DR245) similarly reiterated its call for an end to the matching contribution regime, though it suggested it be replaced by a 200 per cent rural-specific tax incentive. And fishing industry participants (see, for example, sub. DR239) endorsed the draft report proposal on the basis that the matching contribution regime for the fisheries sector would be unaffected.

However, for the most part, there was very strong opposition to any cut in the matching contribution cap.

At a broad level, a large number of participants asserted that it would be foolish to reduce government funding for a model that is widely acknowledged to have worked well. Many also:

- pointed to the empirical work suggestive of high returns to past investments in rural R&D in general and by the RDCs in particular (see chapters 4 and 5), and/or
- reiterated that the pursuit of food security (see chapter 3) provides a compelling reason for the government to maintain or increase its funding for the RDC program.

Many participants further contended that, for various reasons, producers would not fill the funding gap left by reduced government funding — leading to an array of deleterious impacts. A small sample of the commentary to this effect is reported in box 7.2. Underpinning much of this commentary was the perception that because of deficiencies in the levy system in addressing free-riding, and limitations on farmers' capacity to pay, generous government support will always be necessary to encourage rural industries to invest in R&D.

Yet another broad contention was that while the Commission had rejected using the past empirical work to establish overall research funding and expenditure targets, its funding proposals for the industry-focused research sponsored by the RDCs involved the use of no less arbitrary targets. For instance, the Department of Agriculture, Fisheries and Forestry opined that:

> The Commission finds that it would not be appropriate to establish a target level for overall spending on rural R&D, but goes on to recommend a reduction in the cap on government matching funding to 0.25 per cent of an industry's gross value of production. Insufficient evidence is provided as to why this is the appropriate level of funding. (sub. DR266, p. 5)

Box 7.2 The effects of reduced government funding: stakeholder views

From its discussions with stakeholders [Dairy Australia] sees little evidence that farmers will be willing to increase levies to meet a shortfall in government support (because of the high discount factor they apply to R&D). In fact, given that many within industry see the current funding arrangements as a partnership with government there is a risk that the withdrawal of government funding would see diminished desire on the part of farmers to contribute to ongoing industry levies … (Dairy Australia, sub. DR265, p. 9)

The government funding contribution was an important element in getting growers to agree to make their levy contribution in the first instance. By breaking this contract and withdrawing the government's matching contribution it may cause many growers to withdraw their support for the levy also. If this were to occur then the RDC as a model would collapse. Individual growers do not have the resources to fund their own R&D projects … so R&D across the industry may collapse. (Vegetables WA, sub. DR249, p. 4)

It is the VFF's view that a reduction in government funding will simply mean a reduction in the research program for agriculture. Although there are high cost benefit ratios on the RDCs' work, farmers will not be willing to increase the R&D spend due to the long lead times, low return on equity in farming and variable climatic conditions. (Victorian Farmers Federation, sub. DR177, p. 2)

The [Council of Rural Research and Development Corporations] is … very concerned that a departure from the implicit agreement between industry and Government to match industry levy funds up to 0.50% of GVP could undermine the RDC model to the long term detriment of rural R&D. There is a significant risk that some industries may vote to reduce their R&D levy rates if matching Government funds are reduced. A reduction in funding would also put considerable pressure on RDCs to obtain higher leverage rates on their funds, with consequent pressure on research providers to accept a greater share of the cost of individual projects, or to completely cut funding to projects that had lower returns or lower leverage rates. (CRRDC, sub. DR260, p. 26)

… there is no evidence that [levy payers will fill the gap]. In fact, the result is likely to be a further reduction in rural R&D investment which would negatively affect productivity growth and competitiveness, and have broader social and environmental impacts. (Department of Agriculture, Fisheries and Forestry, sub. DR266, p. 5)

Public/Private partnerships are the most proven and effective way to achieve a sustainable future for rural communities. ... Given the challenges faced by the rural sector it is difficult to see how producers can offset a reduction in government funding through increased levies. The levy is already a cost on production and producers are increasingly squeezed by rising input costs and commodity price pressures. (Ravensthorpe Agricultural Initiative Network, sub. DR253, p. 1)

We are seriously concerned … at the impact [that diminished funding to industry–specific RDCs] will have on the highly problem focused programs that are currently in operation. Current industry levies are used by the existing RDCs to solicit research whose direction and outcomes are closely aligned with the needs of contributing members in that industry. The collaboration between industry and the university sector in this domain provides excellent examples of what is possible in the Innovation Economy. If the level and quality of industry–based research is to be maintained so that Australian rural industries retain their internationally competitive position and capacity for ongoing innovation, RDCs need ongoing security of funding ... (Charles Sturt University, sub. DR259, p. 1)

More specifically:

- The Government of South Australia (sub. DR203) and the University of Western Australia (sub. DR197, p. 3) argued that history demonstrates that reductions in public investment to do not call forth additional private funding — referring in this context to specific experience in areas such as pasture, weeds and soils.
- The Australian Farm Institute contended that relatively rapid pass through of the benefits of successful research to other parties means that levy payers would be unlikely to increase their current contributions and that, as a consequence:

  … the proposed reduction in matching government funding is likely to result in a net decrease in total agricultural R&D funding, and the longer-term consequence of this will be a further slowing of Australian agricultural productivity growth, and a reduction in public benefits flowing to the non-rural community. (sub. DR286, p. 4)

- Various participants said that a smaller government contribution would see a greater emphasis on short-term adaptive research at the expense of longer-term strategic work. Also, Southern Farming Systems (sub. DR171, p. 2) perceived that with producers responsible for providing a greater share of research funding, there would be a stronger focus on research into matters affecting established production zones. It went on to suggest that, in a grains context, this would result in fewer research dollars being directed at meeting the needs of new growing regions 'where there is large potential for significant increases in production.'
- There was considerable discussion on the potential flow-on effects for other sources of government funding for rural R&D and for Australia's general rural research capacities. For example:
  - Several participants said that reflecting the RDCs' systems integrating role, a contribution to a project by an RDC will often be necessary to elicit contributions from other parties — meaning that any reduction in the funding available to the RDCs could have significant multiplier effects. The Queensland Government (sub. DR295, p. 12) spoke of a 'cascading effect' from reduced leveraging capacity. Focusing on the particular implications for state government funding, Grain Producers of Australia observed:

    … RDCs provide a large proportion of the operating funds for many projects that are co-funded with research organisations such as state governments and universities. State governments in particular, traditionally provide in-kind/non-cash resources for these projects, and rely very heavily on RDC funds for operating expenses. In the absence of operating cash from [an RDC], state agriculture departments will inevitably close entire projects, put off research staff and reallocate their base funds. Cuts to RDC funding will therefore accelerate the existing decline in funding from State and Territory governments. (Grain Producers of Australia, sub. DR205, p. 15)

The Department of Agriculture and Food Western Australia (sub. DR 243) similarly said that a reduced contribution from the Australian Government for the RDC program could lead State Governments to reduce or withdraw their project-specific contributions to the program — while the Department of Innovation, Industry, Science and Research (sub. DR289) pointed to the potential for reduced government funding for the RDCs to put pressure on other parts of the innovation system.

– The Cattle Council was one of a number of participants to comment on the potential implications for the vibrancy of the rural research community.

> … the recommendation to reduce the public contribution to RDCs will have adverse impacts on the broader rural RDE framework, particularly on the research community that is drawn on to do both industry and public benefit research in agricultural and natural resource science.
>
> … The training ground for Australia's future rural RDE capacity is the research commissioned by RDCs and any withdrawal of funding in this area will have an adverse effect on opportunities and development of young researchers that will form Australia's future RDE capacity.
>
> A compounding influence of the reduced Government contribution to rural RDE is the message it sends to young people interested in rural sciences. Intentionally or not, prospective researchers and students will interpret the reduced Government contribution as reflecting a low priority of importance placed by Government on agricultural science. (sub. DR244, p. 4)

A few participants opposed to the draft report proposal were somewhat more open to the possibility that producers might, over time, increase their contributions, but suggested that there is necessarily significant uncertainty about any such response. Accordingly, they characterised the proposal as a 'risky step into the unknown'. For instance, Dr John Mullen contended:

> At a time when rapid productivity growth is required to meet the challenges of feeding a still growing world population and climate change, it seems important to at least maintain investment in agricultural R&D. Conducting an experiment in reducing public investment in the hope of increasing private investment seems extremely risky. (sub. DR172, p. 6)

And some suggested that while there would be an offsetting increase in private investment, this would primarily occur outside the RDC arrangements — in turn meaning that research outcomes would be less readily available at an industry-wide level. In elaborating, the Winemakers Federation of Australia and Wine Grape Growers Australia said that:

> Reduced government investment in the RDC model will mean that the incentive is there for companies to invest in proprietary research and lock up the benefits to gain

exclusive use. They will try and maximize benefits from the research and undertake in-house or contract research aimed at preventing 'leakage'. (sub. DR192, p. 7)

A somewhat different line of argument was that, irrespective of what 'first principles' considerations might suggest, now is not the right time to be making major changes to funding for the RDC model.

- The Australian Institute of Agricultural Science and Technology (sub. DR182) and the Red Meat and Livestock RDCs (sub. DR252) contended that any such changes should wait until comprehensive data on funding flows across the framework are available.
- Agforce (sub. DR238) and the National Farmers' Federation (sub. DR224) said that such changes should only be made as part of a wider review of the entire rural R&D and innovation framework. Likewise, the Cattle Council (sub. DR244, p. 5) argued that at a time of major change in the broader RD&E framework, 'it would be unwise to conduct a secondary experiment to reduce funding to RDCs'.
- More generally, the NSW Farmers' Association said that to withdraw some of the Government's current funding would be:

  … extremely untimely given the foreseeable challenges and opportunities faced by the agricultural sector. Without sustained investment to develop solutions to water reductions, climate variability and rising prices for fuel and fertiliser, the Australian economy will miss the opportunity to capitalise on large populations in our region entering global food markets. These are issues which are outside the lifetime of many of the farmers who will be deciding on industry's R&D investment, making it unrealistic to expect their support. (sub. DR224, p. 3)

Finally, there was also some particular commentary on the Commission's draft proposal as it related to very small rural industries. At the public hearings, New Rural Industries Australia (trans., pp. 141–3) said that the proposal would see the government contribution for some very small, statutory levy paying, industries within the RIRDC umbrella reduced by half. It argued that this would be inappropriate in terms of the scope to maintain effective research programs for these industries, and inconsistent with the status quo approach which the Commission had proposed for small industries that pay voluntary levies to RIRDC. In a similar vein, the Horticulture Taskforce (sub. DR283) said that the focus of this aspect of the draft proposal on industries within the RIRDC umbrella discriminated against small industries paying voluntary contributions to Horticulture Australia Limited (HAL).

7.3 The Commission's assessment

The Commission has listened carefully to these responses and evaluated the various arguments on their merits.

How strong are the contrary arguments?

In the Commission's view, a significant number of the arguments outlined above are not well founded.

- The contention that industry-focused rural R&D is not deserving of any public funding support is clearly erroneous. As outlined in earlier chapters, because of imperfections in the levy system in addressing free-rider problems, without such support, there would be underinvestment in such research from the community's point of view. Likewise, as discussed in chapter 6, it is highly unlikely that dispensing with the matching contribution regime and instead relying on tax incentives would deliver better outcomes for the rural sector or the wider community.
- Conversely, the fact that the RDC model is widely acknowledged to be a good one — including by the Commission — should not preclude changes to the model that could deliver even better outcomes for the community.
- As explained in chapter 4, even if it could be categorically established that Australia's overall spending on rural R&D is too low, it does not follow that government funding for the RDC model — and more particularly support for industry-focused research within the model — should be maintained. Each public funding program must be assessed on its merits, having regard to the public funding principles outlined in recommendation 4.1.
- For the reasons spelt out in chapter 3, the food security mantra does not, of itself, provide a cogent argument for public funding support for rural R&D in Australia. Indeed, there are some parallels with the now discredited 'defence significance' arguments that were previously advanced by a variety of manufacturing industries seeking to maintain high tariff protection.
- As discussed in chapter 4, the Commission disagrees that there is any fundamental inconsistency between its rejection of the case for setting broad research funding targets and the indicators it has used to inform its judgements on the appropriate amount of public funding for industry-focused research within the RDC model. A tops-down target setting approach would lead to adjustments to funding for individual programs (up or down) without any consideration of the absolute or relative merits of those programs. In contrast, while the Commission has looked at the level of support for industry-focused research in

other sectors, that has been in the context of its assessment of the particular benefits and costs of the RDC approach. This is why, in the draft report, the Commission proposed a matching contribution arrangement that would have continued to provide considerably higher public support than the generally available tax incentives.

- The fact that reduced government funding for industry-focused research sponsored by the RDCs could see more private investment in rural R&D occurring outside of the model is not necessarily a cause for concern. The levy regime and matching contributions are in place to guard against the possibility that there would otherwise be insufficient incentives for private parties to invest in R&D. As well as calling into question the magnitude of that concern, the likelihood of such switching would be another reason to believe that the government matching contribution is not inducing a significant amount of genuinely additional research.
- As recent and current weather-related difficulties exemplify, the rural sector will always be facing challenges and pressures of some description. Hence, longer-term funding arrangements cannot sensibly be beholden to 'right time' considerations of this nature. Indeed, waiting for a period of 'calm' would simply be a recipe for policy paralysis. Also:
  - While the Commission considers that the collection of better data on funding and spending flows across the rural R&D framework would be highly desirable (see chapter 11), such better data would not obviate the need for judgment in policy setting. In particular, no matter how good the data, the likely response of producers to changes in government funding support will still be uncertain, meaning that judgement in determining the most appropriate broad RDC funding parameters will remain paramount.
  - As discussed in chapter 4, the fact that the RDC model is part of a broader framework for funding, managing and delivering rural R&D does not mean that changes to the model can only be made as part of framework-wide reforms. Provided that changes to the model put forward in an inquiry of this nature are consistent with sound public funding principles (see recommendation 4.1), they should be little different from the changes that would emerge from a framework-wide review initiative.

The Commission also remains unconvinced by the arguments that producers would not, over time, be prepared to pay more to help fund research that had the potential to provide them with a significant direct financial benefit. In the short term, this may well be the case. However, over the medium to longer term, *and provided it is clear that a lower level of government contribution is here to stay*, the Commission would be very surprised if at least some producers did not do the sums and act

accordingly (either inside or outside the RDC model). The various examples of un-subsidised private investment in rural R&D (see chapter 5) — including through industry contributions to some RDCs that exceed the cap on the matching government contribution — are testimony to this. As a further contemporary example, the sugar industry is facing significant competitive pressures from Brazil which has seen a large inflow of investment from major multi-national companies specialising in research on genetically modified crop varieties. In response to this threat and perceived shortcomings in current sugar industry research arrangements, Australian millers and growers have recently contributed 'emergency funding' of around $10 million to the industry-owned and funded research body, BSES Limited (sub. DR293).

The Commission recognises that rapid pass through of the benefits of successful innovations to consumers and other third parties may reduce the effectiveness of the levy system in addressing free-rider problems. But it questions whether such pass through will always be so rapid as to seriously damage private investment incentives. The evidence of unmatched levy contributions, and the contention that it often takes many years for new innovations to achieve widespread adoption (see chapter 3), would suggest otherwise.

Also, the examples provided by participants of programs where reductions in public funding did not lead to increased private funding were mainly in areas such as pasture, weeds and soils, where research benefits are likely to be spread thinly across a wide range of industries. As such, the inherent incentives for private investment are unlikely to be particularly strong. To cater for this sort of research, the Commission is proposing the establishment of RRA which would be funded (in the first instance) by an appropriation from the Australian Government, rather than through matching contribution arrangements (see chapter 8).

Indeed, with the creation of RRA, levy payers could then contribute funding to their respective industry RDCs knowing that those contributions — and any matching government support — would generally only be used to co-invest in broader research where there was likely to be a commensurate return for their particular industry. In addition, the Commission's proposals to streamline the levy change process (see chapter 10) would reduce the time and cost for industries of raising contribution rates. Other things equal, this would further enhance the expected net return from such an increase in contributions.

Does the magnitude of the private funding response matter?

While the Commission is confident that, over time, many private parties would respond to a reduction in government funding by increasing their investments both inside and outside the RDC model, the magnitude of that response is necessarily uncertain.

The inherent financial incentives for producers to invest in soundly-based research directed at improving their productivity are seemingly strong. Accordingly, and with an albeit imperfect levy system in place, the Commission's expectation is that the degree of replacement of public with private funding could be significant.

However, in many respects, the focus on what would happen to aggregate funding for such research is misplaced. The Commission reiterates that the outcomes for the community are not simply a function of whether there would be more or less R&D investment in total. To advance the interests of the whole community, policy settings must be predicated on sound public funding principles. If this approach is followed in modifying policies, then the presumption should be that there will be a net benefit to the community, whatever the change (up or down) in the funding available to the RDCs, or for investment in rural R&D more generally.

There will always be arguments that many primary producers do not recognise the intrinsic value of productivity-enhancing research and that, therefore, policies cannot be framed on the basis of a considered response to a reduction in government funding. As in other parts of the economy, some primary producers will of course be more attuned to the benefits of research than others. But as noted earlier, government funding arrangements should not seek to compensate for poor decision-making by private parties within a fundamentally sound policy framework. To do so would be to undermine the normal competitive pressures that reward innovative behaviour and wise investment decision-making, to the detriment of the community as a whole.

The degree and pace of change

While the Commission considers that the arguments put in response to the draft report do not detract from the basic case for reducing the level of government support for industry-focused research sponsored by the RDCs, they do have a bearing on the appropriate magnitude and speed of that reduction. In particular, the input from participants has served to reinforce the significant degree of uncertainty about *precisely* how a reduction in this government support would play out. As well as the differing views on the extent to which levy payers and other private parties

would increase their R&D investments, respondents to the draft report have quite reasonably highlighted uncertainties related to:

- flow on effects for State and Territory government funding
- the implications for Australia's collective R&D research capacities
- the degree of pressure in coming years from funding and other changes elsewhere in the framework
- the degree to which reductions in the matching contribution would effect the balance of research within the model, including between longer-term strategic and shorter-term adaptive research; and between research directed at meeting the needs of new versus established production regions.

A degree of caution is therefore called for to help ensure that reductions in government support are not excessive and that the longer-term stability of a highly worthwhile funding model is not put at risk. In this light, the Commission has therefore looked again at the specifics of the funding proposal in the draft report.

Given appropriate phasing arrangements, it remains of the view that the magnitude of the funding reduction envisaged in the draft report was not intrinsically unreasonable — particularly given that, with the creation of RRA, the industry RDCs (other than the FRDC) would be largely relieved of responsibility for funding research that was not of direct and commensurate benefit to their levy payers.

Nonetheless, because of the uncertainties listed above, this is necessarily a judgement call. Also, as spelt out below, the Commission is now recommending the introduction of a second tier, uncapped, matching government contribution to provide a greater incentive for producers to increase their contributions over time. This would address a significant deficiency in the current matching contribution regime and could be particularly important in helping to gradually rebalance public and private funding responsibilities. Amongst other things, it would remove the implicit signal in the current regime that 0.5 per cent of GVP is the right amount for rural industries to be collectively investing in R&D. As discussed, in chapter 6, this signal has seemingly influenced the investment culture in a number of industries.

In the Commission's view, it would be unfortunate if the role and uptake of this new incentive were undermined by too large a reduction in the Government's total funding contribution to the industry RDCs in the short to medium term.

Accordingly, through this second tier subsidy, the Commission is now recommending a more generous overall funding arrangement over the next decade than it proposed in the draft report (see below). In addition, it is now suggesting that the future funding arrangements for all very small rural industries within the HAL

and RIRDC umbrellas should be the subject of further consideration, with a view to ensuring that a reasonable amount of funding is available to meet their research needs.

That said, the Commission does not see the funding levels recommended for the next ten years for industry-focused research sponsored by the RDCs as necessarily being the final 'resting point'. Adjustment pressures and uncertainty about precise impacts in the short to medium term aside, the intrinsic arguments that underpinned the funding reduction proposed in the draft report remain valid. Hence, there will be a need to revisit funding level questions at some stage in the future.

As outlined in chapter 12, some participants called for a relatively early review of the impacts of any reduction in government funding support.

But an early review of the Commission's recommended funding changes could raise some significant problems. In particular, notwithstanding the streamlining that it is proposing to the levy change process (see chapter 10), adjusting levy rates in response to the new funding challenges and opportunities would still take time. It might also be some time before levy payers fully came to accept that they were to shoulder a greater share of the responsibility for funding research of direct benefit to them. An early review could distract from this necessary change in mindset, and even encourage gaming behaviour designed to garner support for a reversion to the previous funding regime.

With these considerations in mind, the Commission is proposing that the next review (see recommendation 12.1) occur at the end of the suggested ten-year phase-in of the new funding arrangements (see below). A review at that juncture would be informed by information on producer responses to the new incentives over an extended period of time, and would therefore provide a sound platform for assessing whether further adjustments in the rate of government contribution would be appropriate.

7.4 The revised funding proposal

The configuration of the matching contribution

There are two broad means by which the current public funding 'knife-edge' could be addressed while still reducing the average per unit rate of government contribution in line with the arguments for lower support outlined above:

- reduce the GVP cap on dollar for dollar matching contributions, but supplement this capped support with an uncapped, second tier, subsidy at a rate of less than dollar for dollar
- implement a uniform uncapped matching contribution set at a rate of less than dollar for dollar.

Each have their pluses and minuses and for any given reduction in overall government funding would redistribute the adjustment burden somewhat differently.

However, as indicated above, the Commission has concluded that the tiered approach would be preferable. There are two reasons for this. First, for the same level of projected government outlays, a single uncapped subsidy would involve a higher rate of support on the marginal dollar of industry contributions than the two tier approach. This would in turn expose the Government to somewhat greater fiscal risk. Second, and more importantly, the two tier approach involves less of a change to what is now a long standing funding arrangement. Indeed, the two tier approach could be seen as a neat way of simultaneously giving recognition to the distinctive characteristics of the rural sector and greatly improving the efficacy of the incentives applying at the margin. That is:

- The distinctive characteristics of the sector would be recognised in the capped dollar for dollar matching contributions provided through the first tier.
- The uncapped second tier would provide an open-ended incentive for additional industry contributions at a rate that could reasonably closely align with the level of support provided for comparable research in other sectors.

Specific rates of support

The funding proposal in the draft report would, based on current industry output values, have reduced the Government's collective contribution to the industry RDCs by around $110 million a year at the completion of the ten-year phase-in period.[2] As indicated above, especially in light of its desire to give the new second tier subsidy maximum opportunity to incentivise additional industry contributions, the Commission is now of the view that a somewhat more generous funding outcome over the next 10 years would be appropriate.

With this goal in mind it considered various permutations centring on the broad tradeoff between the degree of reduction in the cap on dollar for dollar funding and

2 Based on industry GVP cap data supplied by DAFF.

the rate of the uncapped, second tier, subsidy. In many respects, the more important of the two is the second tier subsidy rate. With most levy paying industries already contributing at a level around or above the current 0.5 per cent GVP cap, it is incentives at the margin that matter most for good outcomes.

Setting this second tier at a rate broadly comparable to the general R&D tax incentives would have some in-principle attractions — especially with the distinguishing characteristics of the rural sector recognised in the capped dollar for dollar subsidy. Nonetheless, the Commission considers that a small loading in the second tier subsidy is warranted, particularly to induce behavioural change in those industries where the de-facto signal on optimal investment levels in the current cap arrangements has been influential.

Ultimately, the Commission judges that the most appropriate permutation would be:

- a (gradual) reduction in the cap on the dollar for dollar matching contribution from 0.5 per cent to 0.25 per cent of GVP, as per the draft report proposal
- an (immediately available) second tier, uncapped, subsidy on levy and other eligible industry contributions above the cap at the rate of 20 cents in the dollar. This would provide a level of support some 13 per cent greater than the 17.65 cents in the dollar subsidy (measured on an equivalent basis — see appendix C) that would be available under the R&D-specific tax offset of 150 per cent for businesses with annual turnovers of up to $20 million a year under the proposed new tax incentives (see chapter 6).

As indicated above, by itself, a halving of the industry GVP caps applying in 2009-10 would have delivered a notional budgetary saving of around $110 million in that year. However, by virtue of the second tier subsidy of 20 cents in the dollar, $22 million would have been returned to the system. Moreover, that second tier subsidy would also have been paid on levy contributions above the current matching dollar for dollar contribution cap. In 2008-09, such contributions were close to $70 million (see table 2.3), though the Commission's understanding is that in 2009-10 the figure was around $40 million. Using these numbers, the implied total reduction in funding to the industry RDCs would end up being around $75 million to $80 million a year.[3]

In the Commission's view, a reduction of this order of magnitude at the end of the proposed ten-year phase-in (see below) would strike a reasonable balance between the intrinsic case for a significantly lower level of public support and the need for some caution about its actual extent given the various uncertainties about producer

[3] This ignores the small funding changes that could ensue from any special arrangements for smaller rural industries falling with the HAL and RIRDC umbrellas (see later).

responses and the like. It also notes that with the creation of RRA, there would be much less pressure on industry RDCs to invest in broader research not intended to provide a direct benefit to producers — thereby further easing the adjustment pressure on those RDCs and their constituents from the proposed 'starting point' government funding reductions.

In addition, and very importantly, a reduction in government funding of the order of $75 million to $80 million a year would be the maximum that would eventuate. If the second tier subsidy had the intended incentivising effect, and producer contributions increased, there would be smaller overall reduction in public funding support. By way of illustration, a 25 per cent increase in current industry contributions by the end of the 10-year phase-in period would deliver additional government matching contributions of around $12 million a year.

That said, the Commission reiterates that these more generous funding arrangements relative to the draft report proposal should be seen as an interim step and not necessarily a final 'resting point'.

Funding implications for individual RDCs

A reduction in the cap on matching dollar for dollar government contributions to 0.25 per cent of GVP, combined with the introduction of an uncapped matching contribution of 20 cents per dollar of industry contributions above the cap, would affect individual RDCs somewhat differently.

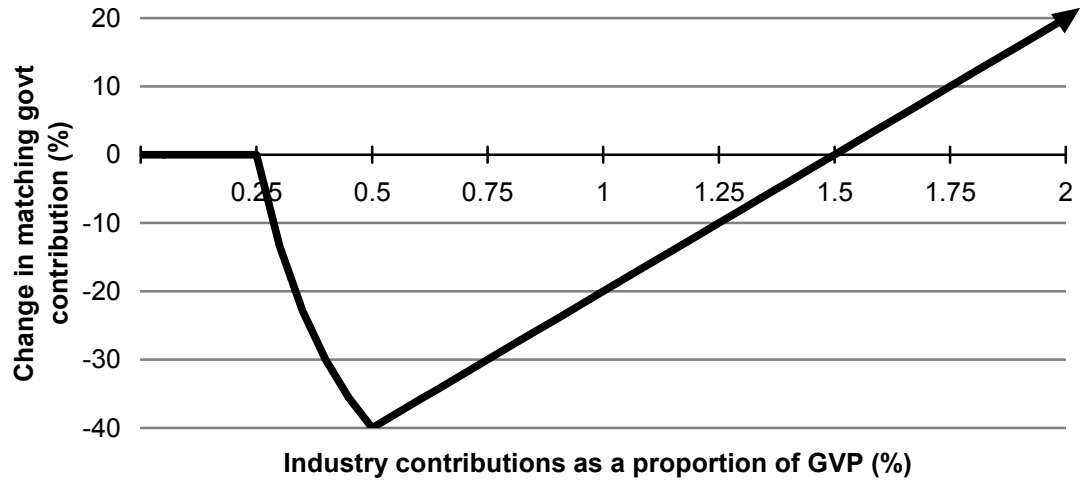
Most obviously, funding outcomes would depend on the extent to which industries responded to the second tier subsidy by increasing their contributions. But for the purposes of comparison, it is most useful to examine how different RDCs would be affected on a 'levy and GVP constant' basis.

- The maximum impact would be experienced by those RDCs servicing industries where levies and other industry contributions presently deliver revenue roughly equivalent to the current 0.5 per cent GVP matching contribution cap. Other things equal, government funding for these RDCs would be 40 per cent lower at the end of the ten-year phase-in period.
- At the other end of the spectrum, the government contribution to the FRDC for research on behalf of individual fishing industries would increase by a small amount. This is because, unlike the other industry RDCs, the cap on the matching dollar for dollar contribution to the FRDC is already set at 0.25 per cent of GVP and some individual industries pay levies that exceed this cap**.** These above-cap contributions would attract the second tier subsidy payment.

- Other RDCs would experience a reduction in government funding, but of less than 40 per cent:
  - In those cases where industries are contributing in excess of the current 0.5 per cent GVP cap, the second tier subsidy would provide some public support for industry contributions that presently attract no government funding. For example, in 2008-09, levy contributions by grain growers to the GRDC and by wool producers to Australian Wool Innovation were both roughly double the Government's matching contribution (see table 2.3). At this proportionate level of industry contribution, government support would be around 20 per cent lower at the end of the ten-year phase in period.
  - Similarly, in those industries that are currently contributing at a rate of between 0.25 and 0.50 per cent of GVP, the gradual reduction in the cap on dollar for dollar matching government contributions would have a lesser impact than in those industries that are operating at or above the cap.

The relationship between industry contribution rates and the change in government funding under the proposed new funding regime is depicted diagrammatically in figure 7.1.

Figure 7.1 **Change in matching government contributions**[a]
Levy and GVP-constant basis[b]



[a] At the end of the proposed ten-year phase-in period. [b] Assumes no change in industry GVP and the value of levies and other eligible industry contributions.

Such divergences in funding outcomes for individual RDCs could be seen by some as inequitable. It might also be argued that the payment of subsidies on existing industry contributions that currently attract no government support is unnecessary and would simply constitute a windfall gain, particularly for the grains and wool

industries and their RDCs. (As indicated in table 2.3, these two industries account for large bulk of current above-cap contributions.)

However, almost any change to the current matching contribution arrangements would have differential impacts across the RDC community. Thus, as mentioned earlier, fisheries interests were accepting of the halving of the dollar for dollar contribution cap proposed in the draft report seemingly mainly on the basis that, unlike the other RDCs, that change would have had no funding implications for the FRDC.

More importantly, the Commission sees no reason why foresighted behaviour by some industries should not be rewarded. The above-cap contributions made by producers in industries such as grains and wool are exactly in accord with the original intent of the RDC model and with the notion that primary producers should be meeting the bulk of the cost of industry-focused research that is of direct benefit to them. In any event, seeking to quarantine existing above-cap industry contributions from eligibility for the new second tier subsidy would greatly complicate the new arrangements and create obvious incentives for the industries concerned to temporarily reduce their existing contribution rates. This would clearly be counterproductive.

Importation of existing industry funding

The introduction of a second tier subsidy could potentially provide incentives to bring some industry and other private investment in rural R&D that is currently outside of the RDC model into the tent so as to attract this government contribution. As discussed in chapter 5, in several rural industries, there is considerable private investment outside of the model.

In a general sense, paying a government contribution on 'imported' research activity would be little different from subsidising existing levy contributions that exceed the current matching contribution cap.

Moreover, where private investors are able to access R&D tax benefits, it seems unlikely that the incentive for importation would be particularly strong. It is true that the proposed second tier matching contribution would be considerably more generous than the current basic R&D tax incentive and slightly more generous than the proposed new tax offset for small and medium sized companies. Also, the definitions of eligible R&D within the RDC regime are more permissive (see chapter 6). Equally, investing through the model brings with it additional compliance costs. As well, there is less scope for targeting research to meet producer/firm-specific needs.

Further, offsetting any research transfers in, there would likely be transfers out. That is, a sizeable amount of research which currently benefits from dollar for dollar matching contributions would in future attract a subsidy of 20 cents in the dollar. This reduction in the subsidy rate could be sufficient to tip the balance in terms of whether continued investment through the RDC model was worthwhile — especially if investment outside the model attracted support through the tax incentives. For these reasons, the Commission considers that there is likely to be little fiscal risk from any redirection of private research consequent on the proposed new matching contribution regime.

That said, any research importation into the RDC model to take advantage of the second tier subsidy could well take the form of some sort of voluntary contribution to the RDCs concerned. As discussed in chapter 10, the Commission has no issue with providing government support for voluntary contributions that come from industries or groups of producers on a collective basis. But it is opposed to providing matching government support for voluntary contributions intended for research that is mainly of benefit to a single entity. Here again, with the proposed new tax incentives in place, the relatively small difference between the dollar value of those incentives and the second tier subsidy would tend to limit the practical significance of this concern. Nonetheless, the Commission is recommending the introduction of new conditions on matching government support for voluntary contributions to remove the possibility of problems of this nature (see recommendation 10.3).

Phasing arrangements

In the draft report, the Commission proposed that the reduction in the cap on the matching dollar for dollar government contribution to 0.25 per cent of GVP occur gradually over 10 years. This was intended to give RDCs and their industry constituents a substantial period of time to adjust to reduced government funding — and to provide producers with ample opportunity to increase their contributions to fill at least part of the funding gap.

While the Commission is now proposing a more modest reduction in the level of government funding and an explicit financial incentive for producers to increase their contributions, as figure 7.1 illustrates, for most of the RDCs significant adjustments would still be required. Thus, it would be neither sensible nor reasonable to move immediately to the end point of the new funding regime.

Complementing the reduction in the cap on matching dollar for dollar contributions with a second tier, uncapped, subsidy complicates the design of a phasing arrangement.

- The culture changing objective of the second tier subsidy would logically suggest that it be introduced in full immediately. As well as providing the earliest possible incentive to producers to adjust their contributions, immediate introduction would give due recognition to the time and cost involved in changing levy rates (see chapter 10).
- But if the second tier subsidy is immediately given full effect, while at the same time the cap on dollar for dollar contributions is reduced very gradually, even without any increase in producer contributions, there would be a short-term rise in total government outlays. (This is a reflection of the sizeable amount of levy contributions above the current contribution cap in the grains and wool industries in particular.)

An initial short-term increase in total government funding on this basis could be viewed as somewhat contradictory with the broad thrust of, and basis for, the changes being proposed. Accordingly, the Commission gave consideration to the alternative of a 'grace period' approach. This would entail giving the RDCs and their producer constituents a reasonable period of time to plan for the new funding regime and then introduce the regime in full.

However, the grace period approach would have some significant disadvantages. In particular, it would provide a further 'window of opportunity' for debate about the merits of the ensuing changes. This would add to the uncertainty for stakeholders about what lay ahead and would most probably inhibit the sort of adjustments required to accommodate the new funding arrangements.

Moreover, in the Commission's view, a temporary and small increase in government funding at the outset of the phasing program should not be of great concern. On a levy and GVP-constant basis, the additional cost to the Government of funding for the industry RDCs in the first year of the phasing program would be at most around $5 million**,** with seed funding for RRA adding only another $5 million (see chapter 8). And by year 3, when the budget appropriation for RRA was beginning to ramp up, funding for the industry RDCs would be at least $12 million lower. (Total funding outcomes are discussed further below.)

More generally — and while total funding outcomes should not be ignored — there is a sense in which those outcomes should be a consequence of getting the right subsidy arrangements in place. Hence the Commission considers that immediate introduction of the uncapped second tier subsidy, in combination with a phase-down

of the cap on matching dollar for dollar contributions, would be the best implementation approach.

As to the period of the phase-down, even with the immediate introduction of the second tier subsidy, several considerations argue for a relatively long timeframe.

- The process of gearing up RRA would take time (see chapter 8), meaning that it would also be some time before its operational interface with the industry RDCs was bedded down.
- Adjustment of the industry RDCs' research programs in response to both the creation of RRA and the changes to their own funding arrangements could not occur overnight.
- It would take time for industries that wished to respond to the new incentives by increasing their levy contributions to do so.

On balance, the Commission considers that the ten-year period proposed in the draft report remains appropriate.

Arrangements for very small rural industries

As noted, for industries that make voluntary contributions to RIRDC, it has been the policy of RIRDC to generally match those contributions up to a cap of $300 000 a year. Included amongst these are industries that are very small and for which RIRDC's current contribution equates to considerably more than the generally applicable cap of 0.5 per cent of GVP. (These include the essential oils and plant extracts, native foods and tea tree industries.)

Reductions in government funding for these industries consequent upon the application by RIRDC of the generally applicable proposed new matching contribution arrangements might mean that there would be insufficient resources available to support even very rudimentary research programs. Though the Commission does not consider smallness (or newness) to be a generally applicable rationale for public funding support (see chapter 3), threshold effects of this nature are a relevant consideration. Hence, in the draft report, the Commission proposed that RIRDC's current funding approach should remain unchanged.

As alluded to above, the same considerations are also relevant to very small:

- statutory levy paying industries within the RIRDC umbrella (such as goat fibre and lychees)
- voluntary levy paying industries serviced by HAL.

It was on this basis that some participants argued that the special treatment proposed in the draft report for some of the RIRDC industries was discriminatory.

The Commission has not calculated how application of its new general funding proposal would precisely affect each and every very small industry within the RIRDC and HAL umbrellas.

However, what is clear, is that extending the differentiated treatment proposed in the draft report for the very small industries paying voluntary contributions to RIRDC would not be straightforward. For example, with some of the other industry groups referred to above paying statutory levies, a judgement would need to be reached on a cut-off industry size at which the generally applicable matching contribution regime would take effect. A new 'knife edge' would thereby be created. A further complication is that, depending on their rate of contributions, it is conceivable that some very small industries might be better off under the proposed new general regime.

Especially as the overall funding implications of changes to the support arrangements for these groups of very small industries are unlikely to be large, the Commission considers that the best way forward in this area should be determined by DAFF following further consultation with the CRRDC, HAL, RIRDC and the industries involved. This consultation process and the subsidy arrangements that emerge from it, should aim to:

- deliver a reasonable level of resources for research activity in the industries concerned
- ensure that access to these arrangements is appropriately limited in terms of both industry coverage and the duration for which special funding support is available.

The Commission further notes that two relatively large rural industries — horses and fodder — also pay voluntary contributions to RIRDC. As a percentage of GVP, their contributions and the matching contributions from RIRDC are very low. For example, the Australian Fodder Industry Association (sub. DR255, pp. 2–3) said that RIRDC's Fodder Research program involves a total investment of $400 000 to $500 000 a year, or around 0.02 per cent of the value of fodder production. Indeed, in that submission, the Association spoke of the difficulties faced in collecting contributions to fund fodder research. Some of the causes of these difficulties — such as the problem of finding a suitable levy collection point, and the spread of research benefits across a wide range of industries — suggest that there may be a role for RRA in this area.

But whatever happens in that regard, for voluntary contributions that are provided to RIRDC by these two industries, the same sort of funding materiality considerations that apply to very small industries are again relevant. Future research funding arrangements for these two industries should therefore be encompassed by the consultation and decision-making process outlined above.

Concluding remarks

The funding proposals outlined above are designed to give effect to two of the three core changes required to the current RDC model, namely to:

- require producers to gradually take on greater responsibility for funding industry-focused research sponsored through the model
- rectify the absence of an explicit public funding incentive for producers to increase their investments in the model over time.

And they do so in a measured way that has regard to the various concerns raised about the magnitude of the government funding reductions entailed in the draft report proposal.

In these regards, the role of the proposed second tier, uncapped, subsidy is pivotal. In addition to mitigating the extent of the reductions in overall government funding at the end of the ten-year phase-in period, it is through this second tier subsidy that industries which chose to increase their contributions to the model would in return receive some additional funding support from the Government.

As noted in the previous chapter, this second tier subsidy has not been explicitly tested with stakeholders. However, the Commission reiterates that the lack of incentives for producers to maintain or increase their contributions to the RDCs underpinned many of the concerns expressed about the draft report funding proposal. From that perspective, the second tier subsidy is a sensible response to a significant design flaw in the current arrangements which cannot reasonably be ignored.

In regard to total dollar impacts, as outlined above, the revised and improved proposals would reduce government support for industry-focused research sponsored through the RDC model by a maximum of $75 million to $80 million a year at the end of the ten-year phasing period.

But given the apparently high private returns to such research, the Commission is very confident that, over time, at least some producers/industries would respond to the changed funding arrangements by increasing their contributions. To the extent

that this happens, the second tier subsidy would serve to provide some additional government contribution towards the cost of the research involved. Hence, the reduction in annual government funding for the industry-focused component of the RDC arrangements could be considerably less than this $75 million to $80 million upper bound.

Moreover, the Government would also be making a significant new contribution for broader rural research through RRA (see chapter 8). While the precise level of that contribution would only become apparent once RRA's remit was fully developed, the Commission considers that an appropriation in the ballpark of $50 million a year would not be unreasonable for indicative purposes. Indeed, were the Government's appropriation for RRA to be of this order, producers would only have to replace a relatively small share of the reduced public funding for the industry RDCs to maintain, or even increase, the total amount of public and private funding deployed within the RDC model.

The preceding observations are important for putting this component of the Commission's funding proposals in appropriate context and for addressing any claims that the future of either the RDC model or Australia's overall rural R&D effort could be put at risk. That said, the rationale for the proposed changes and those related to the establishment of RRA (see chapter 8) is to reconfigure the current funding regime in a way consistent with good public funding principles and thereby deliver a better return for the community from its substantial investment in the model. From that perspective, and as emphasised frequently in this report, the likely aggregate funding outcomes are not the appropriate basis for judging the merits of the proposed changes.

RECOMMENDATION 7.1

The basis on which the Australian Government matches levy and other eligible industry contributions to the Rural Research and Development Corporations (RDCs) should be modified as follows:

- ***The generally applicable cap on the Government's dollar for dollar matching of eligible industry contributions 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 10 years, with the cap reducing by 0.025 per cent of GVP each year during this period.***
- ***There should be a new uncapped matching contribution of 20 cents per dollar for eligible industry contributions in excess of the applicable cap on dollar for dollar matching. This new contribution should be introduced in full at the commencement of the phase-in of the lower cap on matching dollar for dollar contributions.***

- ***Contributions made to RDCs through donor company arrangements by an individual private entity (as defined in recommendation 10.3) should not be eligible for any matching government contributions.***

Future matching contribution arrangements for very small industries paying statutory levies or making voluntary contributions to the Rural Industries RDC (RIRDC) or Horticulture Australia Limited (HAL) should be determined by the Department of Agriculture, Fisheries and Forestry, following further consultation with the Council of Rural Research and Development Corporations, HAL, RIRDC and the industries involved. This consultation process and the subsidy arrangements that emerge from it, should aim to:

- ***deliver a reasonable level of resources for research activity in the industries concerned***
- ***ensure that access to these arrangements is appropriately limited in terms of both industry coverage and the duration for which special funding support is available.***

This process should also encompass future arrangements for matching voluntary contributions made to RIRDC by the Fodder and Horse industries.

8 Catering for broader rural R&D

Key points

- A further major deficiency in the current RDC model is that it does not cater well for broader rural research.
  - Pressure from producer interests will make it difficult to divert government funding that is bundled with industry contributions away from industry-focused research.
  - As a considerable number of the key stakeholders now accept, the Government's funding for broader rural research should therefore be managed separately from its contribution for industry-focused R&D.
- There are two generic ways in which such separation could be pursued: earmark a portion of the government contribution to each RDC for use in funding broader rural research, or create and fund a dedicated non-industry RDC.
  - In the Commission's view, the latter approach would be much less prone to 'industry capture' and therefore be more likely to deliver an appropriate level and mix of broader rural research.
  - For the same reason, a completely new entity would be preferable to the alternative of reconfiguring the Rural Industries RDC.
- Specifically, the Commission is proposing that the Government create and fund a new non-industry, statutory RDC — Rural Research Australia (RRA).
  - RRA's broad remit should be to invest in non-industry-specific R&D that promotes productive and sustainable resource use by Australian rural industries. Its precise remit should be determined through a consultative process to be completed within 12 months.
  - In each of the first two years of its operations, RRA should receive seed funding of $5 million.
  - Thereafter, it should be funded under a quadrennial agreement at a level which would allow for implementation of its agreed agenda in a timely way and without excessive reliance on leveraging from other funding sources.
  - RRA should be subject to the same broad governance, reporting and consultation requirements as other RDCs. However, there would be some particular requirements, including to promote effective engagement with those other RDCs.
- Following the establishment of RRA, the industry RDCs (other than the Fisheries RDC) should be left to focus predominantly on funding R&D of direct benefit to their producer constituents.

As discussed in chapter 6, the other major deficiency in the current RDC model is that it does not cater well for broader rural research. While there is no bright line boundary between industry-focused and broader research, facilitating R&D where a high proportion of the benefits flow to the wider community, or where benefits are thinly spread across a sweep of rural industries, is a key justification for the Government's funding for the RDCs. However, effectively meeting these needs is likely to continue to prove difficult while public funding for broader research within the model remains bundled with support for industry-focused research. Simply put, pressure from producer interests will inevitably make it difficult for RDCs to divert government funding that is bundled with industry contributions away from projects intended to serve the particular needs of the industries concerned. Indeed, previous experience suggests that even projects which are presented as addressing the Government's broader priorities have in reality often been of an industry-specific nature.

Accordingly, the third plank in the Commission's proposals for the future funding of the RDC model is that the Government's contribution for broader rural R&D should in some way be managed separately from its contribution towards industry-focused research that is linked to levy (and other industry) payments. Significantly, the need for some sort of change of this nature is now accepted by a considerable number of the key stakeholders.

This chapter assesses possible means to achieve separation of the management of the two government funding streams; sets out the basis for the proposal in the draft report to establish a new non-industry RDC — Rural Research Australia — and participants' responses to that proposal; and details the Commission's revised recommendations in the light of that commentary. Though it is still recommending the establishment of RRA, the input from participants has helped the Commission considerably in refining the new entity's role, configuration and interface with the other RDCs and industry stakeholders.

8.1 Funding separation options

There are two generic ways in which separation of the management of government funding for industry-focused and broader rural research within the RDC model could be pursued:

- quarantine or 'earmark' a portion of the government contribution provided to each RDC for use in funding broader rural research, with direction from the Government on how that funding should be spent

- use a dedicated, government funded, RDC as the primary vehicle to sponsor such research

Both approaches have parallels in current or past RDC arrangements. For example, the Rural Industries RDC (RIRDC) and the Fisheries RDC (FRDC) both receive a funding appropriation for broader research that is not linked to industry contributions. Likewise, the recently abolished Land and Water Australia (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, and funded by the Government accordingly.

Moreover, within either of these two generic approaches there are different permutations. In the case of the quarantining approach, for instance, suggestions from participants included:

- leaving each RDC to determine, in consultation with the Government, precisely how its quarantined funding should be spent
- placing the quarantined funding in a separate pool to be allocated to specified projects through a contestable process
- using this quarantined funding to help establish a series of cross-sectoral joint R&D ventures between RDCs and other relevant interests.

Similarly, the dedicated RDC approach could involve the creation of a completely new entity or a reconfiguration of one of the existing RDCs.

Also, the two generic approaches need not be mutually exclusive. Thus, the proposal put forward in response to the draft report by the Council of Rural Research and Development Corporations (CRRDC) involved elements of both (though without explicit quarantining of any of the Government's funding for the industry RDCs).

That said, as the following discussion highlights, the choice between the two approaches seemingly rests on some higher level considerations, with the particular permutations of each approach being of less relevance in this context.

The best broad approach

At the outset, it is important to emphasise that the success of either approach will depend on the skills and goodwill of those charged with giving effect to its particular requirements. Good models that are poorly implemented are unlikely to deliver the intended results. Conversely, good people can often overcome or work around deficiencies in bad models. In this regard, some RDCs have seemingly taken seriously the Government's calls for greater investment in strategic, cross-sectoral

and other broader R&D. In other cases, any changes in research focus appear to have been minimal at best.

Obviously, the policy choice in this area cannot be dictated by personnel and personalities as such. Equally, the 'systemic' capacity of each of the two approaches to limit behaviour which would run counter to the objectives being pursued, is relevant to that choice. Indeed, as elaborated on below, this has been an influential factor in the Commission's judgements on which approach would be preferable.

In assessing the particular merits of the two approaches, the Commission gave some attention to research synergies.

- As the Grains RDC (sub. 129, p. 36) observed, quarantining government funding for broader rural R&D within each of the existing industry RDCs could make it easier to realise synergies with industry-focused research. This is especially the case as the two types of research will often overlap.
- Against this, 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. (Some further commentary on synergy issues is provided in section 8.4.)

However, in the Commission' view, the key tradeoff is between, on the one hand, ensuring that broader research no longer plays second fiddle to industry-focused research; and, on the other, ensuring that there is appropriate engagement with industry stakeholders in developing the broader research program and facilitating the adoption of program outputs.

Prima facie, and as many of those responding to the draft report proposal to create RRA argued (see below), the industry engagement goal will be easier to achieve under the quarantined funding approach. In essence, such engagement could occur through the existing consultation and information dissemination structures which, for the most part, have been an important strength of the RDC model (see chapter 5). More specifically, these existing structures could assist in realising any synergies between extension activity directed at the uptake of the outputs of industry-focused R&D and those of broader research. They would also provide a ready-made vehicle to harness relevant input from industries into the broader research program.

But in many respects, these are advantages that reflect the model's long history in facilitating industry involvement in the development and delivery of the rural research agenda, rather than design features specific to the current configuration of

the model. That is, provided there were appropriate mechanisms in place to facilitate interaction with industry stakeholders, there is no reason why a separate RDC charged with sponsoring broader rural research could not engage with industry stakeholders in much the same way as the current industry RDCs. And while the absence of any funding 'skin on the table' would reduce the stake that producers had in the work of the new entity, the same would also be true were government funding provided to the existing RDCs for broader rural R&D to be kept separate from the public contribution for industry-focused research. In other words, in either case, engagement with industry would have to be driven more heavily than at present by the RDCs.

In the Commission's view, the choice between the two approaches therefore ultimately rests primarily on which one would be most likely to deliver an appropriate level and mix of broader rural research. Here, the relative merits of the approaches seem more clear cut.

In particular, creating a single dedicated entity that was not overly reliant on leveraging additional funding from industry sources would significantly reduce the 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 9). However, the Commission is much less certain that such arrangements could be relied upon to ensure that producer interests did not encroach unduly on broader research sponsored by an RDC which also retained responsibility for funding a significant amount of industry-specific R&D.

While many participants responding to the draft report (see section 8.3) contended that greater direction from the Government on its particular research priorities could help to guard against the subjugation of broader research needs, past experience does not give great cause for confidence on this front. Though some RDCs have 'played the game', comments from others to the effect that there should be no diminution of the current emphasis on industry-focused research (see chapter 6) are illustrative of the pressures and tensions that would still exist were the quarantined funding approach to be employed.

Also, with appropriate engagement mechanisms in place, it is conceivable that a dedicated, non-industry, RDC would be in a better position to facilitate the uptake of the outputs of some types of broader rural research. Again, there is likely to be pressure on industry RDCs to focus their extension activities on the adoption of research that provides a direct benefit to industry stakeholders. In contrast, a separate, government-funded, RDC could provide resources to facilitate practice changes in the

farming community that would primarily benefit the wider community — and build the necessary supporting internal expertise in these sorts of extension matters — unencumbered by competing claims from levy payers and other producer interests.

The Commission acknowledges that creating a new non-industry RDC, or reconfiguring an existing RDC for this purpose, would involve some establishment costs.

That said, in the context of the Government's overall funding commitment to the RDC program, these establishment costs would seemingly be modest. And given that administrative expenses as a share of funding do not appear to be correlated to an RDC's size (see chapter 5), it is also hard to see that the ongoing costs of managing a given quantum of funding for broader research would be greatly different for a separate entity than under the quarantined funding approach. Indeed, while the use of separate entity might entail some additional board-related costs, the specialisation of research functions could well give rise to more than offsetting administrative efficiencies. Furthermore, the quarantined funding approach would have its own costs. Apart from the need for discussions between the Government and each RDC on how its quarantined funding should be invested, resources would also be required to ensure compliance with agreed investment decisions. In addition, the CRRDC's proposal (see box 8.1) involved an arbitration mechanism to address any disputes that arose about an individual RDC's funding of cross-sectoral projects.

More importantly, over the coming years, many millions of dollars will be invested in broader rural research through the RDC model. Spending that money unwisely, or in a way that otherwise provided little benefit for the wider community, could therefore be very costly — in turn suggesting that any differences in the establishment or ongoing administrative costs attaching to the two approaches should be a relatively minor consideration in coming to judgement on the best way forward.

In sum, while the quarantined public funding pool approach would be an improvement on the current arrangements, the Commission considers that using a dedicated, appropriation funded, RDC as the primary vehicle for sponsoring broader research would be better still.

8.2 The draft report proposal

Against this backdrop, in the draft report, the Commission proposed that the Government should create and fund a new non-industry RDC — Rural Research Australia. The Commission suggested that the research remit for RRA should

broadly encompass the productive and sustainable management of land and water resources, and energy provision and use within the rural sector. It went on to observe there could be a range of other topic areas that might reasonably fit within RRA; as well as opportunities to embody research functions and (funding) that are currently performed by other bodies. Accordingly, the Commission sought further advice from participants on precisely what research remit RRA should have.

In regard to funding for the new entity, the Commission suggested that a direct government contribution of around $50 million a year might ultimately be appropriate, with RRA able to leverage further funding from other sources — though it also stressed that the 'right' level of government funding would ultimately depend on RRA's precise research remit. The Commission again sort further advice on these funding matters.

Notably, the Commission did not explicitly canvass the option of reconfiguring an existing RDC to perform broadly the same role as RRA. As discussed below, the latter approach, delivered through a revamped RIRDC, was strongly favoured by a significant number of respondents to the draft report. While the Commission considers that the revamped RIRDC option would be clearly preferable to the existing arrangements, for the reasons spelt out in section 8.4, it has concluded that RRA remains the best approach.

8.3 Responses to the draft report proposal

As alluded to above, there was considerable acknowledgement that changes to the current RDC model are required to help ensure that part of the Government's, and thereby the community's, investment in the model goes to fund genuinely broader rural research. Beyond that, the proposal to create a new government-funded, non-industry, RDC attracted both strong support and strong opposition.

Those supporting the approach saw such an entity as an effective means to address the disincentives for industry RDCs to invest in broader research. For example, the University of Tasmania contended that:

> We strongly support the establishment of a new … corporation with a broad mandate across land, water energy and biodiversity. It has been our experience that despite encouragement from government for greater collaboration amongst the industry-based RDCs to undertake public good RD&E … their primary focus is the interests of their levy payers which has left [these public good areas] under funded and under provided ... The specialist expertise, systems, networks and people required for strategic research purchasing across the breadth of land, water, energy and biodiversity is unlikely to be developed by adding these responsibilities to existing organisations … (sub. DR210, p. 1)

The Australian Wine Research Institute (sub. DR240, p. 4) said that the formation of RRA 'has a strong basis in logic', while the Victorian Department of Primary Industries stated that:

> Notwithstanding Victoria's concerns about the quantum of funding, the early establishment of a cross-sectoral entity is considered an imperative. (sub. DR 168, p. 5)

That said, those supportive of RRA in a general sense also observed that the effectiveness of the new entity would depend crucially on its configuration and detailed remit (see later). In this latter regard, several argued that because much rural R&D has a mix of public and private benefits, industry RDCs should still have an important role to play in sponsoring research that has wider benefits. This led the New South Wales Department of Industry Investment (sub. DR274, p. 5) to conclude that RRA should be a relatively small entity.

On the other side of the ledger, reactions to the suggested establishment of RRA were coloured by the strong opposition to any reductions in government funding for the industry RDCs (see chapter 7). In effect, the Commission's proposals were often characterised as a case of 'robbing Peter to pay Paul.' For instance, the Chairman of the Grain Producers of Australia Seed Committee said that:

> I support the concept of developing R&D programs for sectors of the Agricultural industry which are currently missing out, or inadequately supported — but not at the expense of current, highly successful programs. (sub. DR212, p. 3)

Likewise, Dr Meredith Sheil contended that:

> The lack of funding for rural R&D into land, energy and water, has been identified in the draft report — and the conclusion that a minimum of 50 million dollars is required for investment in this area is welcomed and should be strongly supported, but not at the expense of other areas of agricultural R&D endeavour — particularly those that are already showing evidence of under funding. (sub. DR204, p. 9)

Indeed, even Andrew Campbell (sub. DR275) — the ex CEO of LWA — who supported the establishment of RRA, referred to the possibility that a concomitant reduction in funding for industry RDCs could 'poison the waterholes' and thereby make it more difficult for RRA to build the necessary linkages with those RDCs.

There were also various criticisms of the intrinsic merits of the RRA approach. At a broad level, these included contentions that:

- The approach is based on the false notion that it is possible to neatly separate rural research on the basis of whether the benefits are public or private.

  > The essential point is that there are typically multiple beneficiaries from seemingly specific agricultural R&D projects, and it will substantially diminish the outcomes of such research and possibly lead to duplication if attempts are made to separate

investing organisations into those only funding private or public benefit. (Australian Academy of Science et al, sub. DR209, p. 3)

- Nominating a general approach and an indicative funding level without having first established precisely what research gaps currently exist, is putting the cart before the horse.

  The … management principle that 'structure should follow strategy' is no less applicable to rural R&D than to other commercial business and should be followed in this case. In contrast, [the proposal to create RRA] puts structure before strategy by proposing the establishment of RRA before its R&D responsibilities and priorities for public good and cross-sectoral R&D have been determined. (CRRDC, sub. 260, p. 15)

More specific criticisms included that:

- RRA would be a costly option relative to alternatives for catering broader rural research needs that worked within the existing RDC arrangements.

  [The Department of Agriculture, Fisheries and Forestry (DAFF)] believes that there is no need to create a new RDC to undertake non-industry specific R&D focused on achieving public benefits. The administration costs of establishing a new RDC would be high, and would require industry to spread resources more thinly for engagement. (sub. DR266, p. 9)

- With a separate entity, the close interface with industry would be lost, increasing the risk of investment in low value research and impeding the uptake of research outcomes by producers.

  Realising desired public benefits from RD&E requires the uptake of new technologies by producers and other members of the supply chain and successful adoption is critically dependent on industry recognising and valuing the commercial benefits of adopting the technology. It is the latter point that the red meat and livestock RDCs consider is the most compelling reason why the Commission's draft recommendation in relation to the formation of RRA should be reconsidered. (sub. DR252, p. 26)

  ... improved environmental outcomes are more likely to be attained by incorporating resource management strategies in a technology bundle that is profitable for farmers to adopt. The development of such technology bundles is less likely if the responsibility for research is arbitrarily split between the RDCs, who are concerned about the incentives facing farmers to adopt technologies and the RRA, which is less likely to have such concerns. (Dr John Mullen, sub. DR172, p. 3)

- The creation of RRA (in combination with reductions in government matching contributions — see chapter 7) could see the focus of the industry RDCs narrow even further, leading to a reduction in investment in collaborative and other cross-cutting research.

  There is a risk with this model that the industry-based RDCs would begin to disinvest from research that has strong public good outcomes, on the grounds that RRA would be expected to pick it up. (CSIRO, sub. DR219, p. 4)

- It is not clear why an approach which has 'failed' in the past would be successful this time round.

  [LWA and ERDC] which had similar working briefs to that proposed for RRA, both failed in the face of Commonwealth Government budgetary pressures. The Commission has not provided justification as to why a re-run of the failed model will succeed now when it has already been unsuccessful twice within the RDC system. (Grain Producers Australia, sub. DR205, p. 16)

- A designated stream of public funding for broader rural R&D would be more secure were it housed within the existing industry-focused RDC umbrella.

  [The absence of] strong stakeholder links that are a strength of the RDC model, would also leave [RRA] a 'political orphan' likely to suffer the same fate as [LWA] at some future date. (Australian Livestock Exporters Council, sub. DR258, p. 4)

Those opposed to the creation of RRA put forward a variety of alternatives. CSIRO (sub. DR219, p. 4) suggested that the Commission revisit the merits of the quarantined funding approach discussed above, while the Cooperative Research Centres Association (sub. DR218, p. 2) contended that the 'cross-sectoral innovations needs of regional Australia could be better met by CRCs.' Many others — including DAFF (sub. DR266, p. 8) — suggested that expanding the role of RIRDC would be a more cost effective means to address currently unmet broader rural research needs and would also preserve the strong industry linkages perceived to be lacking in the RRA approach. Indeed, RIRDC itself advanced its credentials to take on a wider role:

> … RIRDC considers that its structure and mandate make it a strong alternative to the proposed Rural Research Australia recommended by the Commission. Public good research and integrative disciplinary approaches to on the ground research issues has been the hallmark of RIRDC's approach since its inception. RIRDC has the strong support of its industry stakeholders in expanding its emphasis on public good research.
>
> RIRDC has already established considerable research advisory, policy and collaborative approaches and documented procedures for undertaking cross-cutting research. It has in place the experience and in-house and national advisory expertise to bring together diverse funding and expertise to expand its social good research and development in the agricultural sector. It also has extensive research partner relationships across governments to underscore expansion of social good research. … [Expanding RIRDC's role] could proceed with minor modifications to its current structure and with a clearly specified set of operating principles. This would involve considerable administrative and set up cost savings and build on RIRDC's historically strong linkages to diverse industry groups including those from other RDCs and other research provider agencies and educational training institutions. (sub. DR275, pp. 3–4)

That said, the precise role suggested for RIRDC varied. While some saw it as a straight substitute for RRA, others advocated a smaller expansion in its current remit. In particular, the CRRDC and some individual RDCs argued that, with a little

more direction from the Government, it should be possible to get industry RDCs to increase the share of their budgets directed to strategic, cross-sectoral and other broader research. Accordingly, the CRRDC's detailed proposal in response to the draft report (see box 8.1), envisaged using RIRDC in a coordinating fashion, with the augmentation of its direct research role being limited essentially to what the Council referred to as 'high public good' and 'blue sky' areas of the broader research agenda.

Participants also provided various more detailed comments on funding and delivery arrangements for broader rural research, including in relation to:

- specific research remits
- funding mechanisms and levels
- positioning of the arrangements within, and their relationship to, the broader rural R&D framework
- legislative, governance and consultation requirements.

Such issues are discussed below in the context of the Commission's preferred funding and delivery approach.

8.4 The Commission's assessment

The case for a separate RDC remains strong

In the light of the responses to the draft report, the Commission has carefully re-examined the merits of creating RRA to meet the sort of broader rural research needs that have been neglected within the current RDC model.

It remains strongly of the view that using some of the Government's contribution to fund a new (or reconfigured existing) RDC to invest in broader rural research would be preferable to requiring each industry RDC to spend a prescribed portion of its public funding on such research. As outlined in section 8.2, the nature of the research and extension task, together with the need to minimise the risk that industry-specific interests could encroach unduly on that task, are key considerations here.

Though there are undoubtedly past examples where such separation has given rise to problems, equally it is clear that the current approach of seeking to meet broader research needs within an industry-focused RDC regime has not worked either. Notwithstanding the fact that industry RDCs can and sometimes do invest in

Box 8.1 **The CRRDC model for delivering broader rural R&D**

[The] CRRDC acknowledges there are priority areas which the Government sees as important and that need to be addressed over and above the current investment. This model is intended to respond to additional cross-sectoral priorities identified by Government that are not being addressed through current processes, or respond to priorities more efficiently and effectively.

In outline, CRRDC proposes that:

- Government, in consultation with RDCs and other key stakeholders in the rural R&D framework needs to clearly define its priorities for cross-sectoral and public good R&D. As part of this process, it is anticipated that Government will also broadly identify the funding it will commit to addressing these priorities.
- Through the terms of the funding agreements, approval of R&D and operational plans, RDCs should be required to respond to the priorities that have been identified, through a combination of individual RDC investments and cross-sectoral investments.
- [RIRDC] with appropriate re-structuring, will be responsible for identified public good R&D and managing cross-sectoral and collaborative projects between RDCs in areas not already catered for by National RD&E strategies or already being undertaken collectively by RDCs.

[More specifically an] enhanced RIRDC would operate according to the following guidelines:

- RIRDC will have core funding to undertake R&D for public good and new and emerging industries. …
- RIRDC will, with relevant industry stakeholders, identify gaps in meeting public good and cross-sectoral priorities and build a business case for each area of cross-sectoral or collaborative activity. …
- Where RIRDC identifies a co-investment or collaborative project that it [considers] is not best led by them, a suitable lead organisation will be identified and will take responsibility for the project, as currently occurs.
- The programs that RIRDC will lead will be included in RIRDC's five year R&D plan which will then be provided for consultation with stakeholders including the CRRDC, RDCs, DAFF and the PISC RD&E Subcommittee. …
- Upon approval [by the Minister] of RIRDC's five year plan, the Minister will write to individual RDCs directing them to spend the agreed amount of investment on the agreed cross-sectoral projects included in the five year plan. …

It will be appropriate to re-structure RIRDC, including its board and board selection criteria to ensure an appropriate mix of skills and experience to manage its wider R&D responsibilities. An appropriate mix of director's skills would include an understanding of public good investment, adoption by industry and land custodianship.

Source: Extracts from sub. 260.

broader rural research, the interests of their producer constituents remain paramount. In the light of the evidence of what has gone before and the attitudes that remain in parts of the RDC community, the Commission is simply not convinced that reliance on direction from the Government within a still industry-focused setting would be sufficient to prevent the continued subjugation of broader rural research requirements. Indeed, as is evident from the submissions from some individual RDCs (see, for example, sub. DR248), there is not complete unanimity within the RDC community about even whether the 'incremental' changes proposed by the CRRDC to try to give greater emphasis to broader research within the current predominantly industry-focused arrangements are really necessary.

Moreover, while the Government has most probably not been particularly precise in specifying its broader research requirements to the RDCs, greater prescription by the Government, with RDCs simply reacting to those prescriptions, would carry considerable risks. The Commission sees a very important proactive role for an RRA-type entity — in conjunction with the industry RDCs and other relevant stakeholders (see later) — in bringing specialist expertise to bear to both put the flesh on the bones of a broad agenda, and in turn to shape the nature of the agenda itself. In the Commission's view, this sort of agenda setting and focusing role would be much better performed by a separate non-industry entity such as RRA — especially given the wide range of interests involved. The comments by Andrew Campbell on the intrinsic capacities of the industry RDCs to respond to greater direction from the Government are also germane in this context.

> The assertion that, given sufficient direction from government, RDCs and IOCs can meet the need for cross-sectoral R&D through collaboration, to my mind misses two crucial points. Firstly, the transaction costs of collaboration are significantly higher than for programs designed and managed within one RDC … Secondly and more importantly, the big cross-sectoral issues like climate, energy, water, soils, biodiversity and biosecurity — and the interactions between them — are characterised by considerable technical complexity, multiple diverse stakeholders, and significant social, economic and institutional dimensions … They demand research strategy, expertise and systems that are tailored for these issues. This capacity is much more likely to be developed, and to be delivered efficiently, through a dedicated RDC than through part-time managers working to part-time committees whose core business and expertise lies within particular industries, not between them. (sub. DR271, p. 7)

Also, the Commission does not see some of the criticisms of greater separation of the delivery of industry-focused and broader rural research within an RRA-type approach to be particularly compelling.

- The contention that the approach involves an artificial public-private benefit delineation of research projects is to misunderstand its underpinnings. The Commission agrees that few if any research projects will provide only private or

only public benefits, with most having a mix of both. However, as emphasised throughout this report, the role of government funding should be to help sponsor socially valuable R&D that would not otherwise have been undertaken. Thus, in this context, what is being targeted is valuable broader rural research where any anticipated benefits for producers will not be sufficient to induce industry RDCs alone to invest on either an individual or collaborative basis.[1] In effect, the delineation being proposed is not between private and public benefit research as such, but between research that levy payers will have strong incentives to fully or partly fund and those where an industry contribution is much less likely to be forthcoming. This in turn provides another illustration of why the Commission sees implementation of a set of public funding principles that emphasise additionality (see recommendation 4.1) as being very important. Throughout this inquiry, there has been an unhelpful fixation on public versus private benefits and the overlaps between them, rather than on how to ensure that government funding adds genuine value.

- While there will always be greyness about precisely what constitutes a policy strategy and what constitutes a structural response, the RRA proposal put forward in the draft report was inherently strategic in seeking to overcome an acknowledged systemic deficiency in the current RDC model. Indeed, the draft proposal was deliberately couched in very broad terms, with the Commission seeking further input on how to give best effect to the broad strategy.
- As discussed above and elaborated on further below in the context of the RIRDC option, most of the administrative savings from working within the current industry-focused regime are likely to be more apparent than real. More importantly, the Commission reiterates that, from an administrative point of view, the goal should be cost-effectiveness not cost minimisation. For the Government to fund a regime that was ineffective in meeting its broader research needs simply because it was administratively cheaper to operate would be poor policy.

The Commission is, however, highly cognisant of the *potential* risks in separating the delivery of industry-focused and broader rural research within the RDC regime. As emphasised earlier, effective industry linkages are very important — both in

[1] As noted in chapter 3, after the event, and once the research has been paid for, producers that adopt the research outputs concerned may well derive a benefit. In other cases where the benefits from practice change at the farm level accrue entirely to the wider community, it is possible that either incentives or regulation may be required to encourage adoption. But from a policy perspective, what matters in the first instance is whether the expected benefits before the event would be sufficient to induce private parties to invest absent any contribution from the government.

providing a reality check on the worth of proposed research, and in facilitating the adoption by producers of research outputs.

Were an RRA-type entity to operate in isolation from the industry RDCs, then these risks would be considerable. But there are clearly means other than co-investment — such as common board membership and strong consultation requirements (see below) — to achieve the sort of linkages necessary to facilitate good outcomes. There are similarly means to reduce the vulnerability of an RRA-type entity to short-term budgetary pressures and, very importantly, to ensure that its establishment does not lead to disinvestment by the industry RDCs in collaborative and strategic research.

The Commission also accepts that if the RRA approach is mistakenly portrayed as simply a reincarnation of LWA, then gaining support within government for the approach could be more difficult.

For good reason, an RRA-type entity would have parallels with LWA. Virtually all of those with whom the Commission consulted, considered that LWA made a valuable contribution. 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 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 RDCs. Indeed, several participants considered LWA's abolition to have been a highly retrograde step (see box 8.2).

That said, the entity that the Commission envisages would have some important differences. As outlined below, as well as having a potentially much broader research remit than LWA, the governance of the entity and its role within the broader rural R&D framework would be of a quite different ilk. It is therefore simply erroneous to portray the RRA approach as revisiting the past.

Finally, the Commission recognises that the creation of an RRA-type entity, in combination with the proposed reductions in government funding for the industry RDCs, would initially cause some tensions within the model.

This is not a reason to shy away from either change. The case for reducing public funding for the industry RDCs is not contingent on the creation of a new entity to sponsor broader rural research (see chapter 7). And whatever form a new entity were to take, unless its public funding were to be completely 'new money', there would most probably be some adverse sentiment from industry RDCs and their

stakeholders. Indeed the attitude that public funding for the RDCs is very much 'industry money' appears to lie at the heart of both the difficulty for the Government of pursuing its broader research priorities within the current model, and the opposition from the RDCs and their industry constituents to the Commission's suggested approach for remedying this deficiency.

Nonetheless, as for any policy change involving significant changes to institutional structures and funding arrangements, effective consultation protocols and governance structures that aid good relationship management will be important (see below.) The Commission further notes that as part of its oversighting role, it would be open to DAFF to take specific action against any RDC which sought to actively frustrate the new arrangements.

In the Commission's view, the preceding considerations collectively provide a strong case for using an RRA-type entity to pursue the Government's broader research needs within the RDC regime. Provided there is an effective procedural interface with the industry RDCs and other components of the rural R&D framework, the approach would:

- avoid the significant downsides of retaining government funding for broader research within industry-focused entities
- whilst still providing for the linkages to industry and with the rest of the framework that are essential for good outcomes.

Box 8.2 **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]. (Industry and Investment NSW, 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. 12–3)

[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 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)

However, in the light of the responses to the draft report, the Commission looked carefully at whether a reconfigured RIRDC could deliver much the same outcome as a completely new entity at lower cost and/or with less disruption to existing arrangements.

The RIRDC alternative

In a mechanistic sense, it would be relatively 'easy' to augment RIRDC's current non-industry specific research role along the lines suggested by the CRRDC (see box 8.1).

Yet without a very substantial overhaul, RIRDC could not reasonably perform the range of functions envisaged by the Commission as falling within the remit of a broadly based, non-industry, RDC.

Currently, RIRDC's 'National Rural Issues' research stream is small in both an absolute sense and relative to the entity's industry-focused research activities. In 2009-10, it expended some $12 million on research specific to its established and emerging industries, and just $3 million on its broader research remit. Thus were RIRDC's funding for non-industry focused research to increase to anything like the sort of levels mooted for RRA, there would need to be a complete change of research emphasis — necessitating different skill sets at both the staff and board level; and significant changes to its administrative processes and the nature and scale of its consultations with stakeholders. Notably, even the more limited augmentation proposal from the CRDDC provided for a restructuring of the RIRDC board and board selection processes.

Such a reconfiguration of RIRDC would in turn have major implications for its current industry constituency. If these industries were to remain within the reconfigured RIRDC, there is a significant risk that their research needs could be compromised. Indeed, within an entity focused heavily on broader research, and with a board and staffing profile to match, it seems almost inevitable that the industry research component would suffer.

This risk could be reduced by affording the industry research component greater prominence when appointing the board and hiring staff than relative funding shares alone would dictate. However, this would again see industry research issues encroaching on broader research requirements and thus undermine the whole basis for the reconfiguration of RIRDC's role.

It might also be possible to shift the industries that currently fall under the RIRDC umbrella into other industry RDCs. In some cases (eg. rice), there are ostensibly

ready alternatives. But this is not the case for much of RIRDC's diverse industry constituency. In fact, any pressure to move these industries would most likely create considerable disquiet and disruption and could even threaten the continuation of some of the levy and voluntary contribution streams concerned. For exactly the same reason, the Commission has rejected the idea of the forced amalgamation of industry RDCs to realise administrative economies of scale (see chapter 9).

Accordingly, the reconfigured RIRDC approach would likely entail a potentially dysfunctional amalgam of a major, publicly funded, broader research program and some small scale, highly diverse, industry-focused R&D. Moreover, the need to overhaul RIRDC's structure and processes suggest that the establishment costs might be little different from creating RRA. And while there would be one less board to pay for, the ensuing savings would need to be set against the costs of reallocating industry research functions out of RIRDC and/or any special arrangements retained for those industries remaining within the RIRDC umbrella.

In the light of the above, the Commission remains of the view that if the Government is serious about having its broader research priorities appropriately addressed within the RDC arrangements, the creation of RRA is by far the best option. If well designed and implemented, this 'third plank' to the Commission's core reform proposals could play an important role in meeting a range of significant broader rural research requirements which are widely acknowledged to be falling through the cracks under the current arrangements. In consequence, this component of the Government's funding should generate a considerably greater net benefit for the community than at present.

8.5 Creating Rural Research Australia

RRA's mandate

The establishment of RRA would occur at a time of significant change in the broader rural R&D policy and funding environment. In particular, the National Primary Industries RD&E Framework (outlined in chapter 2) is likely to have a pervasive impact on the delivery of much of Australia's rural R&D — and especially on the distribution of responsibility across governments for contributing to the cost of the various industry and non-industry research streams.

Against this backdrop, the Victorian Department of Primary Industries suggested that RRA could be a vehicle for 'leading national cross-sectoral strategies and priority setting' within the national framework initiative (sub. DR168, p. 5). Many

of the cross-sectoral research themes being pursued within the strategy would fall within the potential research remit of RRA (see below).

The Commission agrees with the broad sentiment underlying this suggestion — namely, that it would be important for RRA to engage effectively with players in other relevant parts of the framework and to contribute to the development of the agenda for broader rural research across the framework as a whole. The National Primary Industries RD&E Framework would therefore be an important touchstone for RRA. Likewise, just as it would be incumbent on RRA to engage effectively with industry RDCs (see below), the new entity would also need to maintain strong linkages with other funders and providers of broader rural research, including State Governments, CSIRO and the universities.

With such engagement, the Commission's expectation is that RRA would play an important role in helping to shape and give effect to the cross-sectoral research strategies within the National Primary Industries RD&E framework. In this regard, it would be no different from the industry RDCs who have been key players in developing the sector-specific strategies within the framework. The Commission further envisages that in pursuit of the framework's cross-sectoral strategies, there could be possibly considerable joint investment between State Governments and RRA. Again, this would be no different from the situation that currently applies to the industry RDCs.

However, 'formalising' such collaboration and explicitly setting RRA the objective of driving the cross-sectoral component of the framework agenda could compromise its effectiveness. Ultimately, RRA is intended to be an entity tasked with investing in broader rural R&D — not an inter-governmental reform body. Giving it the latter role, and thereby enjoining it with multiple government stakeholders through the reform activities of the Primary Industries Ministerial Council and its committees, could see its governance processes become extremely bureaucratic and its administrative costs increase exponentially. Also, were the restructuring process occurring within the National Primary Industries RD&E framework to build in any funding rigidities (see chapter 11), RRA's capacity to reallocate its funding to new and emerging needs could be compromised.

Similarly, the Commission is not attracted to giving RRA a wider role within the Australian Government in regard to the across-portfolio coordination of investment in broader rural R&D. This would ostensibly require the establishment of RRA outside of the PIERD Act framework, and would again most likely involve cumbersome governance arrangements and blurred lines of accountability. In the Commission's view, creating RRA within the PIERD Act framework, and relying on a separate 'low key' mechanism to help coordinate the totality of the Australian

Government's funding for rural R&D (see recommendation 11.2), would be a much better approach.

RRA's research remit

In the draft report, the Commission canvassed a range of possible research areas that might fall within the remit of RRA — including the possibility that this remit might encompass the R&D currently sponsored by RIRDC as part of its 'National Rural Issues' research stream; and also some research funded through Australian Government departmental programs in areas such as climate change and weeds reduction.

But, as noted above, rather than being very prescriptive about RRA's precise remit, the Commission instead sought further input from participants on this matter.

In response to the invitation for further input, the Commission received a range of further examples of potential topic areas to add to those provided prior to the release of the draft report. One of the more comprehensive lists was provided by the Victorian Department of Primary Industries (sub. DR168, pp. 5–6), which suggested that RRA's remit should include:

- soil management
- vegetation management (including weed management)
- climate change and variability
- water management (including groundwater and surface water)
- energy and bio-energy (including generation, use and management)
- landscape change and management (encompassing social and biophysical research)
- animal and plant bio-security and bio-protection
- animal welfare
- food safety and nutrition (pre-competitive)

The department also suggested that RRA could be given responsibility for:

- oversighting and managing core capabilities that are 'fundamental' to the effectiveness of the national research framework; including banks of national plant genetic resources and national reference collections of insects and plant and animal diseases/pathogens
- the successor to Australian Agriculture and Natural Resources On-line.

Others to contribute agenda suggestions included: Australian Research Development Education and Planning (sub. DR180); Cotton Australia (sub. DR220); PGA – Livestock Committee (sub. DR228); and Andrew Campbell (sub. DR275).

In the Commission's view, there are some areas where RRA could relatively quickly develop a valuable research program. Irrigation research (see box 8.3) is a case in point. Similarly, in the light of the discussion in the preceding section on the role of RIRDC, the Commission sees a strong case for quickly transferring RIRDC's non-industry focused research to RRA.

Box 8.3 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 economic, environmental and social 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.'

Nonetheless, 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; the recent cessation of the CRC for Irrigation Futures; and the funding vacuum that will arise when the NPSI ends in June 2011. (See for example, subs. 68, 70 and 90.)

In the past year, the NPSI has convened a meeting of all RDCs to discuss cross-sectoral water R&D priorities and made a presentation to the CRRDC (NPSI 2010).

However, Cotton Australia (sub. DR220, p. 7) — representing a major industry user of irrigation water — contended that there is now a 'need for a more enduring national water use based R&D structure that can take a more strategic investment view of this critical water productivity research area while maintaining stakeholder engagement in research outputs to drive greater adoption and impacts'.

The Commission agrees, though it emphasises that the irrigation research agenda should not be limited to water productivity matters alone. As noted above, there are very important environmental and social dimensions as well. Suffice to say that, building on the efforts of LWA, it considers that RRA could quickly play a key role in this area.

More generally, however, the Commission is now of the view that it would not be sensible to try to specify a precise remit for RRA from the outset. As noted earlier, it sees RRA as playing an important role in shaping that agenda. Also, as the South Australian Government (sub. DR203, p. 5) observed, the development of RRA's agenda should proceed in close consultation with other funders of broader rural research so as to guard against unwarranted duplication of research effort and to help ensure that important research areas are not ignored.

Accordingly, the Commission considers that the best way to proceed would be for the board of RRA to be appointed, and for that board to then develop a proposed agenda. This agenda setting process should in turn involve:

- discussions with DAFF and other relevant areas of the Australian Government. A particular focus for these discussions should be on opportunities to beneficially transfer research responsibilities (and the associated funding) from departmental programs to RRA
- engagement with the PISC on what sort of broader research within RRA would best contribute to the further development of the National Primary Industries RD&E Framework
- consultation with the industry RDCs on an appropriate broad delineation of research tasks. (As discussed below, it will also be critical that there are effective ongoing procedural linkages between RRA and the industry RDCs to facilitate co-investment on research of common interest and to help ensure that RRA's research outputs are adopted by primary producers)
- consultation with researchers and major research providers such as CSIRO and the universities to both elicit advice on what areas of unmet broader rural research offer the prospect of the largest gains for the community, and to ensure that RRA's remit is compatible with the skills available in the research community.

The RRA board should then seek the agreement of the Government for its proposed remit and initial research agenda and the funding appropriation necessary to deliver that agenda.

The Commission considers that this process of bedding down RRA's research remit could reasonably be completed within 12 months from the time the board is appointed. But it emphasises that this remit should not then be viewed as set in concrete. There should be scope to add in relevant new areas of research that may emerge. The Commission also notes that while a firm agenda could be developed reasonably quickly, it would take somewhat longer for RRA to implement that agenda, with implications for the build up of the entity's funding appropriation from the Government (see below).

Finally, the Commission reaffirms that RRA's remit should not extend to the broader fisheries research currently sponsored by the FRDC. Though this research directed at promoting the sustainable management of aquatic resources transcends individual fisheries, it still has a strong sectoral emphasis. Accordingly, these research responsibilities and the government appropriation for that research should be retained within the FRDC. This approach was strongly endorsed by fishing industry respondents to the draft report and not challenged by any other parties.

Funding for RRA

The indicative government appropriation for RRA of around $50 million a year suggested in the draft report was a judgement call based on amongst other things:

- the Commission's impression of the extent of the broader rural research agenda to which RRA might usefully contribute
- LWA's expenditure levels — around $40 million in 2007–08 — in pursuit of its narrower research agenda
- a concern to make RRA less intrinsically reliant than LWA on leveraging additional funding from third parties.

The latter consideration is not to detract in any way from the need for RRA to have a close relationship with the industry RDCs (see below), including through the sort of co-investment that was commonplace with LWA. From time to time, co-investment with other private parties would also be appropriate.

However, if by virtue of its base funding appropriation RRA were to become overly-dependent on partnering with industry interests, there would be a risk that the intended broader focus of its research program could be compromised. Also, leveraging funding from third parties can be an administratively expensive exercise. Viewed in this light, LWA's leveraging ratios — which towards the end of its life involved around $2 of external funding for every $1 of base public funding — seem to the Commission to have been excessive.

That said, in reflecting on the responses to the draft report, the Commission is now much less certain about the merits of specifying any sort of public funding target for RRA. The appropriate level of that funding would evidently depend upon the entity's precise research remit — including the extent to which it took on responsibility for research currently delivered through other publicly-funded programs. In addition, a large broader research program would take time to develop — meaning that the rate of transition to an ultimate funding 'resting point' would necessarily be very difficult to predict in advance.

Given such uncertainties, the Commission is attracted to the funding approach put forward by the Victorian Department of Primary Industries. Specifically, the Department (sub. DR168, p. 5) proposed that RRA receive seed funding to support its establishment and to engage with other relevant parties as part of the agenda shaping process. Further funding would then be provided as RRA's remit was progressively refined. (The same sort of approach was also suggested by the CRRDC (sub. DR260. p. 22) for its proposed more limited augmentation of RIRDC's non-industry research functions.)

'Protecting' RRA's public funding

As the LWA experience illustrates, without an industry constituency to defend it, RRA would potentially be more exposed to short-term budgetary pressures than the other RDCs. That is, while RRA could and would augment its appropriation from the Government with contributions from industry interests — including those other RDCs — such co-investment would be on a project-specific basis and dependent on there being a benefit for the industry concerned.

To help address the funding vulnerability issue — and also to encourage industry buy-in to, and engagement with, RRA (or an alternative non-industry entity) — Cotton Australia (sub. DR220) proposed that:

- All government funding for the RDC program should continue to be initially provided to the industry RDCs.
- These industry RDCs would then be required to remit a designated portion of that public funding to RRA (or other like entity).

In elaborating, Cotton Australia (p. 3) said that the approach would preserve the matching contribution regime, 'while developing a proportional funding mechanism for cross sector, non-industry specific RD&E through an appropriately cost effective structure that maintains broad producer involvement.' It further observed that a similar approach is employed for contributions by some of the RDCs to Plant Health Australia.

At face value, the approach has some attractions. In particular, without necessarily changing the ultimate distribution of government funding between RRA and the industry RDCs, it would notionally give those industry RDCs and their producer constituents a direct financial stake in RRA's activities.

But on closer inspection, this benefit may be more apparent than real. Over the longer term, 'skin on the table' would only be likely to motivate industry support for RRA if producers could influence how their RDCs' mandatory contributions to

RRA were spent. Otherwise, the contribution to RRA would be tantamount to a tax. Hence, without the sort of non-financial mechanisms to promote engagement between RRA and the industry RDCs (see below), the Commission considers that this 'second levy' approach would at best be of short-term benefit only.

Furthermore, it would also have some risks. It would introduce obvious incentives for the industry RDCs on behalf of their producer constituents to try to influence RRA's agenda in ways that would not necessarily be compatible with the broader community interest. And, over time, it could encourage the expenditure of resources by the industry RDCs on lobbying the Government to rebalance its funding contribution to industry-focused and broader research, through a 'simple' change to the percentage of the public contribution channelled on to RRA.

Likewise, the Commission is not especially attracted to the approach suggested by DAFF of linking RRA's appropriation from the Government to the value of rural sector output.

> A more sustainable funding model … would be to legislate funding … in the ... PIERD Act as a fixed proportion of total agriculture, fisheries and forestry gross value of production. This would be similar to current funding arrangements for the Fisheries RDC … (sub. DR266, pp. 9–10)[2]

While the approach would lessen the risk that RRA could suffer the same fate as LWA, or be left to 'wither on the vine', it could make it more difficult to accommodate new broader rural research issues. That is, were a funding formula of this nature to be specified in RRA's enabling legislation, an increased level of funding to cater for any significant new research needs would require Parliamentary approval. In any event, given the likely opportunities to beneficially transfer some research responsibilities and the associated funding to RRA from other Australian Government rural R&D programs, any formulaic funding approach of this nature might have to be specified on 'percentage plus' basis.

In the Commission's view, the approach suggested in the draft report — namely, setting RRA's annual appropriation within a quadrennial funding agreement — would be a more flexible means to provide a measure of public funding security. Quadrennial funding agreements are also employed for a number of other Australian Government research entities — including CSIRO, the Australian Institute of Marine Science and the Australian Nuclear Science and Technology Organisation.

Quite reasonably, this approach would not preclude scrutiny of RRA's funding over the medium to longer term. A long-term guarantee of funding 'come what may'

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2 This proposal in fact related to a revamped RIRDC which was the Department's preferred means to better cater for broader rural research within the RDC model (see section 8.3).

would both reduce the scope for legitimate rebalancing of the Government's budget priorities and potentially lessen the disciplines on RRA to look for opportunities to improve its performance.[3]

However, a quadrennial funding agreement would provide RRA with some protection against adjustments in funding motivated by more immediate and potentially short-lived budget pressures. It is these sort of adjustments that can be very difficult to predict and plan for, and which could therefore be much more disruptive for RRA and its researchers, and thereby for its effectiveness in meeting broader rural research needs.

A progressive build-up of funding

In light of the above, the Commission is recommending that RRA receives seed funding from the Australian Government of $5 million a year for the first two years of its life, while its agenda is developed and some initial research contracts are let. Thereafter, RRA's funding appropriation from the Government should be provided under a quadrennial agreement at a level which would allow it to implement the agreed agenda in a timely way and without excessive reliance on leveraging funding from other sources.

More broadly, in establishing RRA, the Government should clearly signal that broader rural research is to become an integral part of the future RDC arrangements and that the new entity's future funding appropriations will reflect this. In so doing, and to help attract the 'right' board and CEO, it would be desirable for the Government to give some initial broad indication of what sort of funding commitment might be entailed. Given the potentially very broad remit for RRA, the figure of $50 million a year suggested in the draft report might not be unreasonable for this purpose — especially as the agenda shaping process would quickly provide a basis for greater precision.

Legislative, governance, reporting and consultation requirements

As a PIERD Act corporation, RRA would be subject to the same general governance, reporting and consultation requirements as the other statutory RDCs.

[3] Though the same is also in some senses true for government contributions to the industry RDCs that are capped on the basis of industries' values of output, in this case, the level of contribution also depends on how much producers opt to pay. Hence, there is an in-built performance discipline within the matching contribution regime.

Amongst other things, RRA would have a skills-based board and be required to:

- comply with the proposed new RDC principles (see recommendation 9.1)
- consult with all relevant stakeholders in determining its research agenda
- meet a range of general reporting requirements and participate in a cross-RDC project evaluation process (see recommendation 9.7)
- commission periodic independent reviews of its performance (see recommendation 9.8).

However, because of the different nature of RRA, there would be some important differences in how these requirements were given specific effect.

As well as providing access to an appropriate range of skills, RRA's board should also be structured to facilitate engagement with both the industry RDCs and the States and Territories as key players within the broader rural R&D framework. Were RRA, like most of the other statutory RDCs, to have a total of eight board members, this would suggest a board composition along the following lines:

- one, deputy secretary level, member from DAFF as the portfolio agency through which government funding for RRA would be provided
- one, equivalently senior, State and Territory Government member nominated by the PISC
- one member from the other RDCs — either the independent chair of the CRRDC, or a chair of one of the other RDCs elected by the Council
- the balance of the membership complementing the above skills by bringing to the table specific research knowledge and funding and management expertise necessary for RRA to effectively discharge its responsibilities. While these board members could be employees of government agencies they would not necessarily be so. Indeed, to provide both commercial acumen and to facilitate linkages with private sector interests, some representation from that sector on RRA's board would be highly desirable.

With DAFF having a senior staff member on the board of RRA, the Commission's general proposal that there be scope for an RDC and the Government to agree to the appointment of a 'government director' (see recommendation 9.5) would be met as a condition of establishment rather than on a consensual basis.

The special circumstances of RRA would also require a different approach in regard to the Government's role in the priority setting and planning process. In chapter 9 (recommendation 9.2), the Commission is proposing that the requirement for Ministerial approval of industry RDCs' research priorities and plans generally be

ended. But for RRA (and the FRDC), in recognition of the Government's much larger direct stake in research outcomes, it has recommended that the current requirement be retained. The Commission is likewise suggesting that the proposed scope for statutory RDCs to engage in marketing activity (see recommendation 9.3) not apply to RRA.

Further, there is the issue of whether the 'designated representative body' arrangements that currently apply to all statutory RDCs should apply to RRA. As described in chapter 9, under the PIERD Act, when developing their research programs, the statutory RDCs must consult with designated industry bodies nominated by the Minister. Those designated bodies also have a right to participate in selection committees for board appointments to the statutory RDCs. However, in light of the non-industry focus of RRA's activities, it is questionable whether such requirements would be either necessary or desirable in this case.

- Given the likely breadth of RRA's activities, any mandatory consultation requirement would need to encompass a wide range of bodies; in turn rendering it little different from a generic requirement for RRA to demonstrate that it had consulted with an appropriately broad range of stakeholders.
- The involvement of a large number of designated bodies on the selection committee for the RRA board would be cumbersome — especially with a number of board appointments already specified separately.

Accordingly, the Commission concludes that the RRA should not be subject to the generally applicable designated industry body requirements for statutory RDCs.

In regard to the selection of the 'open' board positions, a selection committee approach should still be used to make recommendations to the Minister. Reflecting the importance, breadth and complexity of RRA's research task, the Commission considers that this selection committee should be chaired by the Secretary of DAFF. That committee should in turn invite suggestions for potential nominees for the open board positions from a suitably wide range of stakeholders.

Finally, in keeping with the general change proposed to the appointment of Chairs of statutory RDCs (see recommendation 9.6), the board of RRA, rather than the Minister, should be responsible for electing its Chair.

Facilitating effective engagement with industry RDCs

Though the Commission has rejected the suggestion that government funding for RRA be channelled through the industry RDCs, it recognises that effective

engagement by RRA with those RDCs will be essential for getting a good return on the public's investment in the new entity.

- As emphasised frequently throughout this report, there is little point in undertaking applied research that is not adopted. Involving the industry RDCs in the development of RRA's research program and extension strategies, and potentially in the delivery of the extension services themselves, will be crucial if many of the new entity's research outputs are to be widely adopted.
- Effective engagement will also help the industry RDCs to participate in, and draw from, RRA's work. Sometimes this will be best achieved by co-investment. In other cases, it may involve an industry RDC taking the RRA's research and doing more specific application work.

Drawing the same sorts of conclusions, the Ricegrowers' Association of Australia (sub. DR179, p. 2) said that 'it is crucial that the RRA engage with industry in the pursuit of its research objectives in order to test the validity of their approaches, provide rigour in their testing and contribute to extension outcomes.'

As indicated above, the Commission is proposing that either the independent Chair of the CRRDC or a Chair of one of the industry RDCs elected by the Council be a member of the RRA board. It is also proposing that these other RDCs be involved in the initial development of RRA's research remit and that, as part of the periodic independent reviews of RRA's performance, there be explicit consideration of whether:

- RRA had engaged effectively with the industry RDCs in a general sense (with a similar assessment of engagement in the opposite direction as part of the performance reviews of these other RDCs)
- RRA's project portfolio included an appropriate number of collaborative investments with the industry RDCs and/or other industry stakeholders
- its extension strategies had given suitable attention to drawing on the skills and producer linkages of the industry RDCs.

Implications for the role of the industry RDCs

Following the establishment of RRA, the industry RDCs should be left to focus predominantly on funding R&D of direct benefit to their producer constituents.

This change in role would not provide a licence for the industry RDCs to shift to the short-term, low-risk, adaptive end of the research spectrum. As reflected in the Commission's proposed RDC principles (see recommendation 9.1), in return for what would still be a significant amount of government funding, the industry RDCs

would be expected to invest in an appropriate amount of longer-term, higher-risk and strategic research. It is this sort of industry-oriented research that would more likely be underprovided were there to be reliance on the levy regime alone and where public funding support can therefore add genuine value for both the industry and the wider community.

Nor would the change in role obviate the need for the industry RDCs to:

- collaborate with their counterparts, RRA 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
- invest in environmental research. As well as productivity-related research that has positive environmental spin-offs, investment in research that reduces primary producers' environmental footprint can be a means to forestall more prescriptive regulatory responses (see chapter 3). Thus the Commission concurs with Denis Lindsey who remarked that:

  > … the creation of the RRA must be achieved in a way that does not absolve or appear to absolve all other agricultural research from including environmental responsibilities (sub. DR176, p. 3)

Accordingly, aspects of the changes that the Commission is proposing to the RDC governance requirements (see chapter 9) are designed to ensure that the creation of RRA does not lead to inappropriate disinvestment in such research by the industry RDCs. At the same time, absent any obligation for industry RDCs to fund research explicitly directed at meeting the Government's broader rural research agenda, as previously mentioned, the Commission is also proposing that Ministerial involvement in their priority setting and planning processes be greatly reduced. The Commission further observes that without the 'intrusion' of a broader research agenda, engagement between the industry RDCs and their producer constituents would likely be more focused and effective.

RECOMMENDATION 8.1

The Australian Government should establish and fund a new Rural Research and Development Corporation (RDC), 'Rural Research Australia' (RRA).

- ***RRA's broad remit should be to invest, on behalf of the Australian Government, in non-industry specific R&D that promotes productive and sustainable resource use by Australia's rural sector.***
- ***Its precise remit should be developed through a consultative process, involving engagement by RRA's board with: the Department of Agriculture Fisheries and Forestry (DAFF) and other relevant areas of the Australian Government;***

the Primary Industries Standing Committee (PISC) of the Primary Industries Ministerial Council; industry RDCs; major research providers and researchers. As part of this process — which should be completed with 12 months — explicit consideration should be given to:

- *bringing the 'national rural issues' R&D (and the associated funding) that is currently the responsibility of the Rural Industries RDC within the new entity*
- *the scope to beneficially transfer any Australian Government departmental research programs (and the associated funding) into RRA.*

However, RRA's remit should not extend to the sector-specific, broader resource management, research undertaken by the Fisheries RDC.

RRA's board should then seek the agreement of the Government for its proposed remit and initial research agenda; and the funding appropriation necessary to deliver that agenda.

- *RRA should be created as a statutory R&D corporation under the Primary Industries and Energy Research and Development Act 1989 (Cwlth).*
  - *In each of the first two years of its operations, RRA should receive seed funding from the Australian Government of $5 million to meet establishment expenses, to allow it to engage with relevant parties as part of the remit and agenda setting process, and to cover the costs of any early research contracts.*
  - *Thereafter, its funding appropriation should be provided under a quadrennial agreement at a level which would allow it to implement the agreed agenda in a timely way and without excessive reliance on leveraging from other funding sources, including from other RDCs.*
  - *More generally, in establishing RRA, the Government should clearly signal that the new entity is to become an integral part of the RDC arrangements and that its future funding appropriations will reflect this.*
- *RRA should operate under the same broad governance, reporting and consultation requirements as other statutory RDCs. However, it should:*
  - *be exempted from the designated industry body provisions*
  - *be subject to the existing rather than the proposed new general arrangements governing Ministerial involvement in priority setting and planning processes (see recommendation 9.2)*
  - *be excluded from the proposed change to allow statutory RDCs to take on marketing functions (see recommendation 9.3)*

  - *have special board composition and selection procedures: specific provision should be made to include a senior member from DAFF; an equivalently senior State and Territory Government member nominated by PISC; and either the independent chair of the Council of Rural Research and Development Corporations, or a chair of one of the industry RDCs elected by the Council. The remaining board members should be appointed by the Minister based on the advice of a selection committee chaired by the Secretary of DAFF.*

- *In giving effect to the requirement for periodic independent reviews of the performance of all RDCs (see recommendation 9.8), the reviews of RRA's performance should explicitly assess whether:*
  - *it has engaged effectively with industry RDCs*
  - *its research portfolio includes an appropriate number of collaborative projects with industry RDCs and/or other industry interests*
  - *its extension strategies have given suitable attention to drawing on the skills and producer linkages of the industry RDCs.*
- *Following the establishment of RRA, the other RDCs — except for the Fisheries RDC — should be left to focus predominantly on funding R&D of direct benefit to their levy payers, with their funding contributions from the Australian Government gradually adjusted in accordance with recommendation 7.1.*

9 Governance and reporting

Key points

- A wide range of detailed changes could be made to the RDC model to try to provide better outcomes, but these could unhelpfully complicate the broader model design and funding reforms that the Commission is proposing.
- The Commission has therefore focused on articulating the principles that should attach to public funding for the RDCs and the discharge of the Government's responsibilities.
- In addition, it is proposing a small number of supporting changes, including to:
  - more clearly articulate the role of public funding support for the RDC program in relevant legislation and funding agreements
  - remove Ministerial involvement in priority setting and approving RDCs' plans, except for the Fisheries RDC and the proposed Rural Research Australia
  - allow statutory RDCs to undertake marketing activity, provided this is approved by levy payers and wholly funded by industry
  - provide RDCs with the option to request a government-appointed director to improve board skills and facilitate communication with the Government
  - enable the board of each statutory RDC to appoint their own chairperson
  - require all RDCs to participate in a cross-RDC project evaluation process
  - mandate that each RDC undertake an independent performance review every three to five years
  - oblige the Department of Agriculture, Fisheries and Forestry (DAFF) to publish an annual monitoring report on the RDCs' collective activities and the outcomes they have delivered.
- It is important that DAFF ensure that all RDCs are meeting their obligations.
  - Serious performance concerns about any individual RDC risk damaging confidence in the model as a whole.
  - An escalating series of monitoring and reporting mechanisms should be employed to motivate an under-performing RDC to improve its performance.
  - Withdrawing funding, in part or in whole, should remain an option in the most egregious instances of under-performance.

As discussed in the preceding chapters, the Commission is recommending some significant changes to the configuration of the current Rural Research and Development Corporation (RDC) model.

While there are also many detailed modifications that could potentially be made to the model, doing so could unnecessarily complicate implementation of the more critical changes required to deliver better value for the community from the model. Furthermore, in a situation where the rate of public funding for the industry RDCs was being gradually reduced, there would need to be good reasons to impose new costs and pressures through the introduction of a large number of prescriptive governance requirements.

The Commission therefore considers that supporting changes to the RDC model should focus primarily on:

- a common set of principles that should apply to government funding for the RDCs, and the discharge by the Australian Government of its responsibilities as a key stakeholder
- a relatively small number of specific changes to give better effect to those principles.

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. But there may be merit in additional changes once the impact of these recommendations (if given effect) has been assessed — a process for which is discussed in chapter 12.

The majority of the changes that the Commission is recommending were widely supported by participants responding to the draft report. Accordingly, in reflecting and addressing participants' views in this final report, the Commission has focused primarily on positions that were disputed, or on issues where it sought further input from stakeholders.

The Commission also received commentary on matters specific to the governance arrangements and performance of individual RDCs. In particular, several participants identified concerns about Australian Wool Innovation (AWI). As this has not been an inquiry into any individual RDC — rather, it is focused on the entire RDC system — the Commission has not sought to replicate recent independent reviews (Arche Consulting 2009; GHD 2010) in considering the performance concerns specific to AWI. That said, those concerns have the potential to damage confidence in the RDC model as a whole. Hence, for the integrity and ongoing health of all RDCs, it is important that the performance issues relating to

AWI are effectively addressed — as would be the case for any other RDC that under-performed in the future.

9.1 A principles-based approach

It is reasonable that RDCs, as recipients of both government funding and money raised through industry levies, should be subject to appropriate accountability measures. This is reflected within the *Primary Industries and Energy Research and Development Act 1989* (Cwlth) (the PIERD Act), industry-specific legislation and statutory funding agreements (SFAs).

As those instruments also recognise, there is a need to provide RDCs with operating flexibility. Given the innate diversity of Australia's rural industries, it is difficult to design effective measures that will be appropriate for all RDCs and the circumstances they operate in. A 'one size fits all' approach, particularly were it to be very prescriptive, would likely do more harm than good. In overall terms, the Commission considers that the current legislative arrangements provide a reasonable balance in this regard.

Nonetheless, the Commission considers that there would be benefit in setting legislation and other regulatory mechanisms pertaining to RDCs in the context of some 'high level', readily understood principles. There are two main reasons for such an approach.

First, there appear to be some matters with regard to RDC conduct and performance that do not receive sufficient attention in the current legislative requirements.

- Consistent with the public funding principles that government funding should be used to induce additional, socially valuable research, there would be value in putting greater emphasis on appropriately 'balanced' research portfolios. While many RDCs clearly recognise the importance of investing some funds in high-risk, long-term or 'basic' (rather than applied) research, some others have invested predominantly in low-risk, short-term or adaptive projects. In general, the latter sort of research is less likely to be truly 'additional', and therefore not warranting the significant public funding support that would continue to be provided to the industry RDCs under the Commission's funding proposals (chapter 7).
- At an institutional level, adoption of research results sometimes appears to be neglected. Yet, as emphasised throughout this report, technically successful research and development (R&D) is of limited benefit if producers ultimately do not make practical use of the results.

- There continue to be concerns about how effectively some RDCs communicate and consult with producers. Also, particular concerns have been raised in some industries about the dissemination of research outcomes. Understandably, producers' confidence in the system can be eroded if there is insufficient transparency about what their contributions are paying for.

Second, the current arrangements are largely silent on some of the obligations that should be met by the Australian Government as a key stakeholder in the RDC model, including in relation to:

- effective engagement and communication with RDCs and their industries
- efficient discharge of their own duties associated with the RDC program
- appropriate monitoring of the performance of RDCs (and, indirectly, the relevant industry representative bodies).

As detailed in prior chapters, the effectiveness of the Government in communicating what it is seeking in return for its funding contribution has been criticised by many participants. Moreover, as the ensuing discussion in this chapter demonstrates, the efficacy of past performance monitoring is open to question.

Taken together, the principles encapsulated in recommendation 9.1 could provide valuable guidance to all stakeholders on what the RDC model should be delivering, as well as the responsibilities and obligations that fall on the RDCs and the Government. In turn, the Commission considers that this would help to facilitate more effective application of the specific legislative requirements detailed in this chapter.

Participants' views

Many participants — including RDCs themselves — indicated that at least some of the Commission's principles simply codified existing practice (or what is intended to be existing practice). As an example of this, the Grape and Wine RDC (sub. DR229) and the red meat and livestock RDCs (sub. DR252) did not believe they would have to substantially vary their processes to accommodate the principles outlined.

However, there was also some critical commentary on the principles-based approach, as well as on some of the specific principles that were articulated in the draft report.

At the broad level, the Council of Rural Research and Development Corporations (CRRDC) expressed misgivings about the application of the principles, arguing that

they lacked 'clarity and definition' (sub. DR260, p. 32) and would therefore be unworkable from a compliance perspective if not substantially revised.

But for some of the principles, procedural issues and other more detailed requirements are effectively covered in supporting recommendations (discussed in subsequent sections of this chapter). More generally, the principles are not intended to be a prescriptive set of rules — indeed, as noted above, taking such an approach would be fundamentally impractical given the diversity of the sector. Instead, the principles provide a template for how industry and policymakers can maximise the benefits from the RDC model for rural producers and the wider community, while still recognising that the circumstances for individual RDCs can vary over time.

That said, the Commission has accepted the thrust of some specific alterations proposed by participants, and amended the wording of its recommendation accordingly. Vegetables WA (sub. DR249) noted that mandating a 'balanced' research portfolio would not necessarily be helpful in all cases, and that policymakers should instead satisfy themselves that RDCs have selected a portfolio mix that is appropriate for their industries. With regard to the same principle, the CRRDC (sub. DR260) argued that the profile of risk and expected return for any given project is not necessarily directly linked to its timeframe. It also noted that the draft formulation of one of the principles implied that the Government had direct responsibility for each industry's nominated representative bodies, when instead such scrutiny could only reasonably be directed through their interactions with the RDCs. Separately, CSIRO (sub. DR219) suggested that the importance of collaboration between RDCs on areas of mutual research interest could usefully be reflected in the principles, as a way to help promote investment in cross-sectoral R&D.

RECOMMENDATION 9.1

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

- ***invest in a project portfolio that appropriately balances long-term and short-term, high-risk and low-risk, and strategic and adaptive research needs***
- ***collaborate, as appropriate, with other relevant RDCs and research organisations in cross-sectoral research***
- ***have in place suitably resourced processes to facilitate 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 relevant information on the outcomes of completed research projects in a timely manner***
- ***through their processes for nominating potential directors and/or engagement with the Government on potential director appointments, facilitate boards that have a suitable balance of relevant skills and experience, rather than a balance of representative interests***
- ***pursue ongoing improvements in administrative efficiency, with regard to both their own activities and those of their research partners***
- ***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:

- ***clearly articulate the role of the RDCs within the broader rural R&D framework***
- ***engage openly and constructively with RDCs and other stakeholders***
- ***discharge its administrative responsibilities in relation to the RDC program in a timely and efficient fashion***
- ***verify that nominated representative bodies for each of the statutory, industry RDCs remain suitably representative of the industries concerned and are not overly dependant 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.***

9.2 Clarifying and refining goals and functions

Objectives and priority setting

As noted in chapter 4, 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 (recommendation 4.1). Consistent with this requirement, the legislation and funding agreements governing the operation of the RDC model should be amended accordingly.

In terms of supporting policymakers' broad assessment of additionality within the RDC model, two of the principles from recommendation 9.1 would provide relevant indicators. These are:

- whether there has been an appropriately balanced project portfolio that covers different time horizons and risk profiles, as well as a suitable mix of basic and applied research
- the degree to which industry RDCs have engaged in collaborative research with each other, with the proposed Rural Research Australia (RRA), and with other relevant entities.

The Commission envisages that with the creation of RRA (chapter 8), industry RDCs would be left to focus predominantly on industry-oriented research, with rural producers providing a greater share of total funding requirements. Although this would not obviate the need for industry RDCs to undertake collaborative research, it would significantly reduce the case for Government to be directly involved in their planning and priority-setting processes.

In the case of statutory RDCs especially — where the Minister is required to sign off on five-year strategic and annual operating plans (chapter 2) — the Commission is concerned about the undue burden such involvement can impose. The Grains RDC (GRDC, sub. 129), for example, noted that the Minister currently approves operating plans on a financial-year timeframe. This delays the trialling of new varieties until the following year because planting has to occur in April–May, but Ministerial approval does not occur until July.

While the Commission received generally positive feedback on reducing Ministerial involvement, there were some concerns. In particular, the Department of Agriculture, Fisheries and Forestry (DAFF) argued that:

> On the basis of its funding contribution, it is appropriate for government to remain involved in high level priority setting ... (sub. DR266, p. 11)

The Commission agrees that there remains an important role for the Government in ensuring that the public contribution to the industry RDCs adds genuine value (including, as noted above, through ensuring that industry RDCs sponsor a suitably diverse mix of R&D, and collaborate as appropriate). However, in its view, this would generally best be pursued through effective monitoring of outcomes and, where they are inconsistent with the intent of relevant legislation and agreements (as per the principles outlined in recommendation 9.1), enforcement of the relevant requirements. Measures to improve monitoring and enforcement are examined in section 9.5.

There is though a case for a greater level of Ministerial involvement in priority setting and planning for RRA and the Fisheries RDC (FRDC) because of the

significant public funding explicitly intended for them to meet broader, non-industry-focused research requirements. But even here, care should be taken to ensure that this involvement does not hinder RRA and FRDC from bringing their expertise to bear. To this end, the Government's specific role in priority setting for these RDCs should be at a relatively high level and not entail prescriptive micro-management.

RECOMMENDATION 9.2

Consistent with the overarching public funding principles for the rural R&D framework (see recommendation 4.1), 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 valuable rural R&D that would not otherwise be undertaken.

With that guidance and the RDC-specific principles (see recommendation 9.1) in place, requirements for formal Ministerial involvement in research priority setting and approving RDCs' strategic and operating plans should be removed, except for the Fisheries RDC and Rural Research Australia.

Marketing and industry representation

The PIERD Act limits the role of statutory RDCs to undertaking R&D and associated extension. In contrast, industry-owned corporations (IOCs) have both research and marketing functions, with Australian Pork Limited (APL) also having a formal industry representation role. The Australian Egg Corporation Limited (AECL) similarly exercises a *de facto* industry representation function in the absence of a viable independent body.

Marketing and representation 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 under-invest). Hence, one of the principles in recommendation 9.1 is that RDCs only use government funding for R&D and related extension.

Marketing

As a now well-established feature of the model, the Commission sees little merit in suggestions that there be a return to a research-only focus within the model. (Advocates for such an approach included University of Adelaide, sub. DR197;

Pastoralists and Graziers' Association of WA — Livestock Committee, sub. DR228, and Western Graingrowers, sub. DR245.) As several participants observed, there can be significant synergies between research and marketing activities. For example, Meat and Livestock Australia (MLA, sub. 106) noted that feedback it received through its marketing role had been invaluable in factoring customer requirements into its research program. (Similar observations were made by the Cattle Council of Australia, sub. 83, and AgForce Queensland, sub. 74.)

Furthermore, there are administrative efficiencies in combining roles. For example, MLA (sub. 106) indicated 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. In the case of very small industries with their own dedicated RDCs (such as eggs and AECL), the savings from combining roles, as a proportion of total expenditure, may be very significant.

Recognising the benefits that IOCs have realised through the combination of functions, there is industry pressure to expand the range of functions that can be performed by the statutory RDCs. For example, the Rural Industries RDC (RIRDC, sub. 92) argued 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 (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 with marketing and other functions housed in other bodies. The federation claimed that this would 'align R&D with marketing, knowledge development and key policy development' and create 'efficiencies of at least $500 000 per annum' (sub. 21, p. 12).

Perhaps most importantly, and as DAFF (sub. 156) observed, the shift towards replacing statutory RDCs with IOCs has stemmed from industry perceptions of the services for which producers require collective funding and provision, and how these would best be delivered. Thus, if statutory RDCs continued to be confined to R&D, it is conceivable that more industries would eventually opt to replace them with industry-owned bodies. This suggests that any effort to retain the 'purity' of the remaining statutory authorities is likely to be self-defeating.

In light of the above, the Commission considers that statutory RDCs, other than the proposed RRA, should be allowed to take on a marketing role. (As a non-industry RDC, and without a constituency of levy payers, RRA should purely be a vehicle for broader rural R&D and related extension activity. See chapter 8.) The Commission stresses that the decision for any RDC to assume an additional

function is a matter for its stakeholders to decide. As such, a statutory industry RDC should only take on a marketing role where this is supported by the majority of levy payers and approved by the Minister.

RECOMMENDATION 9.3

The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that the statutory Rural Research and Development Corporations (RDCs) — with the exception of Rural Research Australia — 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.

Industry representation

There was somewhat less support expressed for permitting RDCs to assume industry-representation functions. Industries that regarded their existing representative bodies as effective tended to see little value in allowing RDCs to assume industry-representation responsibilities — see, for example, the Sugar RDC (SRDC, sub. DR236).

In defending its industry-representation role, APL (sub. 117) argued that having multiple functions — including industry representation — under 'one roof' provides greater efficiency, and hence a better return on investment for levy payers. APL further observed that:

- like other RDCs, it is constrained by a 'no agri-political activity' clause in its SFA
- the financial viability of the industry-representation role is better ensured within the 'secure funding frame' of APL
- most other RDCs engage in strategic policy development directed at improving industry or government policies, despite it not being specifically recognised in their legislation or SFAs.

For its part, the Commission accepts that there can be synergies associated with an RDC assuming industry representation functions, just as with marketing. In practice, most independent businesses incorporate multiple functions of this nature without problems, and commonly encourage close liaison between them.

Consistent with its broad view on the combination of functions, the Commission indicated in the draft report that it had no 'in principle' objection to allowing RDCs

to assume industry-representation functions. Nonetheless, it concluded that it may not be prudent to allow any further RDCs to take on such a role *at this time* (given recent and other proposed changes to the system).

In response, some participants (for example, NSW Farmers' Association, sub. DR224; and Commonwealth Fisheries Association, sub. DR239) argued that action to permit representation functions is warranted now, particularly in view of the financial strain some industry representative bodies currently face.

However, the Commission remains of the view that it would be sensible to provide time to assess the efficacy of new agri-political provisions in SFAs. It would be unfortunate if a move to allow an RDC to assume an industry-representation function in turn provoked unproductive agri-political activity that diverted the RDC's attention from its other tasks. Accordingly, beyond AECL and APL — which currently maintain representation functions without apparent problem — the possibility of extending the generally allowable functions of RDCs to include industry representation should be assessed as part of the next major review of the RDC arrangements.

RECOMMENDATION 9.4

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 recommendation 12.1). In the interim, the two RDCs that already have an industry-representation role — the Australian Egg Corporation Limited and Australian Pork Limited — should be allowed to maintain that function.

9.3 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, recommendation 9.1 includes principles that the RDCs and Government should follow to facilitate effective communication.

Dissemination of research outcomes

As noted, there is little point in undertaking R&D if successful outputs are not adopted by producers. That said, even 'unsuccessful' research can have benefits — a point highlighted by the Australian Superfine Wool Growers' Association (sub. DR174). A project that does not, on its own, lead to a commercial application

may inspire new research that does. And knowledge of areas where research has proven entirely unproductive can at least ensure 'dead ends' are not revisited. As such, dissemination of research outcomes — whether actually adopted or not — can be important for stimulating further R&D or on-site innovation by producers.

In this regard, some participants criticised certain RDCs for making insufficient information available on research outcomes, and argued that those RDCs tend to shield some results under confidentiality clauses. As discussed in chapter 4, these views were disputed, particularly by the RDCs concerned. Even so, as RDCs are not investing in research on their own behalf — but rather, for their producer constituents and the Government — there should reasonably be an obligation on them to publish timely information on the outcomes of all completed research projects.

Such a requirement, which is reflected in the Commission's proposed RDC principles (recommendation 9.1), was endorsed by several participants. The Commission expects it would also be broadly consistent with the interests of RDCs themselves. Some of the scepticism over the reported returns from the RDCs' activities (chapter 5) may well stem from a lack of producer awareness about the benefits being delivered by the research concerned. In these circumstances, improved communication with producers about the outcomes from research could help garner support for greater levy and other industry contributions, and thereby contribute to greater private investment in rural R&D.

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 organisations about future plans and report on past activities, including through attendance at the representative organisations' annual conferences or executive meetings.

By acting on behalf of many levy payers in a given industry, representative organisations can be an efficient means for producers to convey their views to, and oversee the activities of, an RDC. Nonetheless, given that changes in industry circumstances can render nominated representative body arrangements obsolete (as, for example, in the grains industry — see box 9.1), and that conflict of interest issues can potentially arise (see below), the Commission considered whether there were better approaches.

The primary alternative would be to amend the PIERD Act so that RDCs are only required to consult with, and report to, a representative cross-section of the industry,

Box 9.1 **Grains Council of Australia**

Having experienced a significant decline in its membership in the preceding years, the Grains Council of Australia went into voluntary administration in June 2010. In response, competing proposals for a new grains industry body were developed: National Grains Australia, with its membership comprised of state farming organisations (chiefly, the NSW Farmers' Association and Western Australian Farmers Federation); and Grain Producers Australia, to be funded by the direct (and voluntary) membership of producers. In September 2010, the Grains Council of Australia's members voted to endorse Grain Producers Australia as its successor body.

Source: Gadd (2010).

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 organisations, assuming such 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. Hence, dispensing with industry representative bodies in this way would most probably require that selection committee consultation processes be revised.
- There would likely be significant opposition within the rural sector to removing the formal status of nominated representative bodies (see, 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).

Accordingly, the Commission does not see the sort of transitory problems that periodically arise in dynamic industry settings as being a sufficient reason to move to a more generic consultation requirement. Rather, industries should continue to resolve such issues on an *ad hoc* basis as necessary — just as in the grains industry.

Funding and conflicts of interest

The situation in the grains industry is, however, illustrative of a more general issue that arises in relation to the role of the industry representative bodies in overseeing the activities of the RDCs. The Commission understands that GRDC reimbursed a large proportion of the Grains Council of Australia's travel and non-travel expenses related to consultation processes in recent years. Similarly, Citrus Australia (trans., p. 800) estimated that around 55 per cent of its funding has come through projects

initiated by the relevant industry RDC, Horticulture Australia Limited (HAL). While such funding from RDCs to industry representative bodies is often allowable, if those bodies receive a large proportion of their revenue from RDCs, this can present significant conflict of interest issues. (It is noteworthy that Grains Producers Australia (sub. DR205) has stated that it is not financially dependent on GRDC, in marked contrast to the Grains Council of Australia that preceded it.)

The Commission is not proposing any specific legislative changes to address this concern. Indeed, it would be difficult to specify on a sector-wide basis a particular share of funding from an RDC to an industry representative body that would trigger action. But in the principles encompassed in recommendation 9.1, the Commission has indicated that the Government should use its authority in overseeing the RDC model to ensure that industry representative bodies continue to be suitably representative of the industries concerned, and not dependent on funding from their respective RDCs.

Government engagement with the RDCs

Recommendation 9.1 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. A commonly cited factor was the amendments made to the PIERD Act in 2007 to remove 'government directors' from statutory RDC boards. Until these amendments, 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 removal of this position followed a review of corporate governance arrangements in the public sector, known as the Uhrig Review (box 9.2).

There is a widespread view that removing government directors from statutory RDCs has, among other things, led to a deterioration in the quality of communication between the Government and statutory RDCs. For example, Andrew Campbell commented that:

> The loss of government directors from RDC Boards … has been an unfortunate retrograde step to the detriment of both DAFF and the RDCs. It has removed a crucial early warning system for both government and industry, an important development opportunity for DAFF senior executives has been lost, and the perceived conflict of

interest that this move was intended to 'fix' was always illusory. (sub. DR271, p. 11)

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 (though not universally) seen as being inferior to the pre-2007 arrangements. The involvement of government officials as observers is different from their previous role as directors. Additionally, the Commission understands that invitations to attend board meetings are not always taken up by government

Box 9.2 **The Uhrig Review of corporate governance**

In 2002, the Australian Government commissioned a review of governance arrangements for 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. The review 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 would 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, and announced that it would implement the recommended governance templates. This was subsequently reflected in official guidelines on the governance arrangements for Commonwealth bodies.

Assessed against these criteria, the Minister for Agriculture, Fisheries and Forestry determined that RDCs 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).

Sources: DOFA (2005); Uhrig (2003).

officials. Cotton Australia, for example, claimed that 'attendance by DAFF representatives at RDC board meetings has been inconsistent and lacking in continuity of personnel and industry knowledge' (sub. 68, p. 29).

Some participants recommended a return to the pre-2007 formal requirement for statutory RDCs to have a government director, and extending this requirement to the IOCs via their SFAs. Legal advice from the Australian Government Solicitor indicated that both would be possible (box 9.3).

However, the Commission has concluded that this approach would not be appropriate.

- 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 recommendation 9.1.
- 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.

Box 9.3 **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.

That said, 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)).

According to the AGS, 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.

- As detailed in box 9.3, Commonwealth public servants who are government directors could potentially face conflict-of-interest issues, which in the case of the IOCs may involve competing 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 commitment to making the current observer arrangements at board meetings work more effectively.

Instead, the Commission considers that an RDC should be given *the option* 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 necessarily 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 (section 9.4). 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.

Given the potential (identified above) for conflicts of interest, a current member of the Commonwealth public service should *not* be a government-appointed director at an IOC. In these circumstances, some participants suggested that such an appointment might differ little from the status quo, where — in the context of selecting a skills-based board (section 9.4) — government experience is regarded as a desirable competency. Were the appointment to be someone without contemporary experience as a public servant, this might well be true. However, individuals who have only recently departed the Commonwealth public service should be better positioned to foster an effective conduit between the board and the relevant areas of the Australian Government.

The Commission emphasises that, under this proposed consensual arrangement, a government director would not be appointed to either a statutory industry RDC or IOC without its agreement. Also, for the reasons discussed in chapter 8, a different arrangement should apply for RRA, reflecting the new entity's structure and remit.

In essence, for this new RDC, provision for a government director should be a core institutional feature, rather than a matter of consensual agreement.

RECOMMENDATION 9.5

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 significant contemporary 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 industry 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.

Government appointments to the board of Rural Research Australia should be the subject of entity-specific provisions (see recommendation 8.1).

9.4 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' abilities and experience against an RDC's requirements; and then make a recommendation to the Minister, who is responsible for appointing candidates. 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 Government. The processes used to select board members under these instruments vary between the IOCs, but the Government has indicated its intention to strengthen the governance requirements in SFAs. This has already occurred for AWI (sub. DR232) and HAL (sub. 101).

The SFAs introduced in 2010 for AWI and HAL specifically refer to the principles and recommendations of the ASX Corporate Governance Council (2007) as a guide to best-practice corporate governance, particularly with respect to the nominations committee. A revised version of the principles and recommendations took effect on

1 January 2011 — including new requirements for board diversity — which may be useful for the RDCs to follow (ASX Corporate Governance Council 2010).

The Commission welcomes efforts through SFAs to give better effect to the requirements for skills-based boards at IOCs. In fact, to the extent that these lead to further improvements in governance, there may be some lessons for the arrangements applying to the statutory RDCs as well.

That said, even the best governance practices will not by themselves ensure delivery of desired performance outcomes. While skills-based selection processes will facilitate board competency and appropriate diversity, they cannot guarantee that boards will always make the right decisions. This again reinforces the crucial role of monitoring the performance of all RDCs. Such monitoring may also help to identify additional refinements that should be made to governance arrangements, including board selection processes. One important task for DAFF will therefore be to monitor the success of new SFAs in improving the application of the requirement for skills-based boards.

Appointment processes for board chairpersons

Separately from the process to appoint board members, the Minister holds the right to appoint the chairperson of each statutory RDC. In contrast though to the nomination process for other directors (through an RDC's selection committee), the Minister is technically able to appoint a chairperson without any consultation.

The Commission believes that this role for the Minister is neither necessary nor warranted. In its view, and as with the boards of IOCs, each statutory RDC board should be permitted to directly appoint a chairperson from within its own ranks. This does not remove government involvement entirely — the chairperson of a statutory RDC will still have received Ministerial approval when being appointed first as a director. Nonetheless, allowing a board to elect its own chairperson would be consistent with good governance practice, should aid the board to operate more effectively, and would lessen potential concerns about undue political interference.

RECOMMENDATION 9.6

The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended to make the board of each statutory Rural Research and Development Corporation responsible for electing one of its appointed directors as chairperson, and setting the term of this appointment.

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 of effort:

> 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)

However, the current division of funding responsibility among many industry RDCs has the potential to frustrate these aims and the pursuit of administrative efficiency more generally.

Tradeoffs in amalgamation

The administrative processes required to carry out 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 entities.

Although the quantitative evidence is not definitive on the relative administrative efficiencies of the RDCs (chapter 5), the preceding considerations suggest that the smaller RDCs in particular could be experiencing significant diseconomies of scale by maintaining their own administrative arrangements. The multi-industry approaches of RIRDC and HAL provide a potential model for bringing smaller industries under the remit of a single RDC, which, aside from any other benefits, offers the prospect of reducing administrative costs.

However, there are limits on the extent to which administrative arrangements can be unified 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 noted that the existing industry-specific arrangements allow 'the development of industry experts with a depth of knowledge in their field, rather than generalists' (sub. 145, p. 26).

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 geographically dispersed base of levy payers. The more industries that are covered by a single entity, the greater the strains that can emerge in its structure. For example, 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. Apple and Pear Australia Limited noted that HAL 'has reached its maximum portfolio size' and 'adding in more industries … would diminish HAL's ability to understand its core business' (sub. 86, p. v).

Indeed, the stability of the whole RDC model could be threatened if individual industries perceived that their particular interests were given inadequate attention within an amalgamated RDC. This was evident in many participants' comments (box 9.4).

Other options for improving administrative efficiencies

Within the current RDC structure, there have been various CRRDC initiatives to improve administrative efficiency (box 9.5). These initiatives seemingly have the potential to address many of the current concerns about duplication or otherwise inefficient administrative arrangements, but in a cooperative rather than coercive way.

Another cost-saving approach embraced by several RDCs is the sharing of office space in different cities (CRRDC, sub. 128 and pers. comm.).

- SRDC has sub-let part of its office for Brisbane-based staff of HAL and APL.
- HAL provides office space for Sydney-based APL staff.
- The Grape and Wine RDC houses an Adelaide-based APL employee.
- Three of the four Canberra-based RDCs — FRDC, RIRDC and APL — intend to co-locate in a single office by the second half of 2011.
- Melbourne-based staff of HAL and APL may co-locate with Dairy Australia or Forest and Wood Products Australia later in 2011, depending on the progress of lease negotiations.

Co-location may also help to foster collaborative research work between the entities sharing office space. (Thus, the chairman of the CRRDC signalled that co-location of the Canberra-based RDCs could promote collaboration on public good projects, particularly between FRDC and RIRDC (trans., p. 619).) Where such collaboration is productive, benefits could be realised in terms of the quality and relevance of

research outputs, as well as from freeing up resources that can then be directed towards R&D programs for the greater benefit of producers.

The Commission notes that there may be further opportunities for co-location — especially in Sydney, which has head offices for six RDCs. Opportunities to reduce administrative costs may also exist in the choice of office locations. The Cotton RDC (the only RDC not based in a metropolitan area) noted that its location 'in

Box 9.4 **Participants' views on amalgamating RDCs**

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. The red meat and livestock RDCs (sub. DR252) estimated that the sharing of administrative resources and joint collaboration between MLA and LiveCorp produces annual savings of approximately $1 million.

The Australian Wool Growers Association 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' (sub. 73, p. 4). Similarly, the Australian Superfine Wool Growers Association 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' (sub. 9, p. 36).

Auscott Limited 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' (sub. 5, p. 4).

AECL argued that a separate RDC should be retained for eggs because the industry 'is unique when compared with other parts of the agricultural sector' (sub. 119, p. 22). It noted that the egg industry has specific R&D needs in regard to 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.

SRDC 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' (sub. 140, p. 46).

Box 9.5 **Initiatives to improve administrative efficiency**

The CRRDC 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.
- 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. The Cotton RDC 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.
- 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 similarly investigating how statutory funding agreements can be standardised, although any application of this would require support from DAFF.
- 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.

Source: CRRDC (sub. 128).

regional Australia provides advantages in connectedness to the research and end users as well as minimises associated location costs' (sub. 114, p. 12). There would, in principle, appear to be some merit in being based closer to industry stakeholders — although staffing and other operational requirements may mean that this is not practical for all RDCs.

No specific policy changes are warranted

Certainly there is much that could be done to promote administrative efficiencies within the RDC system, with the current endeavours of the CRRDC being particularly important in this regard. That said, the degree to which individual RDCs can implement such measures may vary significantly.

Accordingly, rather than a prescriptive 'one-size-fits-all' blueprint relating to administrative improvements, there should instead be:

- a general expectation attached to government contributions that RDCs pursue ongoing improvements in administrative efficiency (see recommendation 9.1)
- explicit assessment of the administrative efficiency of RDCs as part of regular performance reviews. Through this performance assessment process (section 9.5), RDCs should be required to indicate how they intend to address any identified performance problems in this area.

In responding to the draft report, some participants urged the Commission to pursue more specific interventions. As an example of this, the NSW Farmers' Association (subs. 145 and DR224) suggested the Commission should explicitly cost and detail a range of efficiency improvements for the sector to adopt. One specific proposal was to combine all RDC administrative functions, with each RDC essentially operating as a division of a single corporate entity.

However, as discussed, there are various tradeoffs involved in pursuing such efficiencies, which cannot — and should not — be determined on an *a priori* basis, divorced from the particular circumstances involved. This is precisely why within the corporate sector, the size and nature of company structures varies enormously. Hence, any consolidation initiatives should occur as an extension of the current administrative improvement process, and with the backing of the industries concerned.

Remuneration of board members and senior executives

Although an issue publicly raised in advance of this inquiry, the Commission received relatively little comment on director and executive remuneration matters from participants. This may be because criticisms by the then Minister (see, for example, Burke 2009) and others had already made an impact on remuneration policies and levels. (For example, the Commission understands that the remuneration of some senior executives at AWI and GRDC declined after 2009.) The lack of participant comments may also reflect a view that any remuneration issues are a symptom of broader shortcomings in governance arrangements.

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 are more a matter for boards to resolve rather than being amenable to prescriptive direction (PC 2009).

Further, the Commission notes that in any cases where remuneration arrangements for RDC executives appear inappropriate, the Government can request the RDC to justify its actions — and where it is not satisfied with the response, has the option of imposing sanctions. Directors also face the prospect of not being reappointed if they fail to take account of the concerns of stakeholders.

9.5 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, as indicated, this needs to be backed up by effective performance monitoring and enforcement. In this context, robust project evaluation processes, independent performance reviews, regular monitoring of RDC outcomes, and appropriate remedial action to address under-performance are all important elements of the policy 'tool kit'.

Project evaluations

There is no specific requirement in the PIERD Act or other legislation 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 are discussed in chapter 5.

Evaluations make a useful contribution to efforts to promote 'best practice' performance by RDCs, with lessons from past research — whether successful or not — able to inform future R&D work. They can also be a helpful device in reassuring both the Government and producers that their funding contributions are providing commensurate benefits. Vegetables WA (sub. DR249) was one of a number of producer interests to stress the importance of this particular role for evaluation.

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. Thus, the SFAs for AWI and HAL now include clauses mandating 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. This position has been generally endorsed by the statutory RDCs.

However, SRDC (sub. 140) noted that, while it had thus far willingly participated in the CRRDC evaluation process, it viewed annual evaluations as being unnecessary in the longer term. Specifically, it believed the existing process absorbed staff and funding resources disproportionate to the benefits. Instead, SRDC favoured the sort of five-year evaluation regime that it has employed for its own R&D investments.

Clearly, the costs associated with performance evaluation increase with the frequency of evaluation. But those costs must be set against the aforementioned benefits that robust and timely evaluation can provide.

The CRRDC (sub. 128) noted that it is examining mechanisms by which evaluation costs can be shared so as to ensure that all RDCs can cost effectively participate in its annual 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 (see below), or is delivering little new information, the Commission believes the current CRRDC-sponsored arrangements should be continued. Furthermore, even if less frequent evaluations were judged to be appropriate, the need for independent performance reviews (see below) to draw on contemporary evaluation experience would militate against the sort of timeframes proposed by the SRDC.

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 (drawing on the *Handbook of Cost Benefit Analysis* published by the Australian Government (2006)).

A summary of all of the project evaluations across the RDCs is prepared by the CRRDC secretariat. 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 whether government funding support was necessary for the project to proceed.

The CRRDC acknowledged that there is scope to improve project evaluation methodologies, and has an ongoing program to explore such opportunities. For example, as part of a comprehensive review of its evaluation processes (to be undertaken during 2011), it is examining the extent to which indicators and metrics can be developed to quantify the social and environmental impacts of R&D.

Additionally, the CRRDC will assess ways in which *adoption* initiatives — that is, not simply R&D — could be evaluated (pers. comm.). The Commission considers that these would be useful advancements. Other areas that would merit refinement are the inclusion of administrative costs in the benefit–cost calculus, and the basis for selecting the sample of projects to be evaluated. With regard to the latter, the present 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 would be considered. Again, this would be a welcome enhancement.

Related to peer review, another means to improve the quality of the evaluations would be to revisit past evaluations to examine how relevant or accurate the underpinning assumptions had proved to be. Notably, the Australian Centre for International Agricultural Research (sub. 118) said that it commissions periodic reviews of its initial *ex post* evaluations to assess their credibility. As part of this approach, the scientists involved in the original R&D are asked to observe and comment on adoption outcomes.

The Commission considers that similar assessments by the RDCs would be desirable. Specifically, and as part of the cross-sectoral evaluation process, RDCs could revisit past evaluations to assess whether assumptions about adoption rates and additional extension-related costs have proved to be reliable — and, if not, how updating those assumptions would alter the results. Experience gained from monitoring adoption rates achieved with past projects would in turn help inform assumptions made in future evaluations, both *ex post* and *ex ante*.

Building in such dimensions will increase evaluation costs. Hence, as the robustness of the evaluation protocols increases, there may be a case to reduce the frequency with which such reviews occur. Accordingly, the Commission does not consider that the current annual rolling approach should be 'set in stone'. Rather, such tradeoffs would best be assessed by the CRRDC, given that it has effectively designed the existing parameters for the evaluation process, in consultation with DAFF. (Again, the interaction with the independent performance review process would need to be considered in the tradeoff between frequency and quality.)

Linkages to ex ante evaluation

In responding to the draft report, some participants argued that the Commission had been unduly focused on *ex post* reviews at the expense of *ex ante* evaluation. Dr John Mullen contended that *ex ante* evaluations, even if not quantitatively

exhaustive, could help:

> … research managers to identify in a timely, cost effective and sometimes largely qualitative manner the main economic, environmental and social impacts of new technology, a likely path to adoption and how benefits are likely to be distributed between industry and the community. (sub. DR172, p. 4)

Given the difficulties of knowing precisely what any particular project will yield in advance, the Commission agrees that forward-looking assessments are important, especially in regard to project selection and subsequent research management. Indeed, *ex ante* evaluation (which can be used to estimate expected returns from a particular project) and *ex post* evaluation (which, among other things, can highlight broad areas of fruitful research and guide assumptions to be employed in future evaluations) are inextricably intertwined. For precisely this reason, the proposed RDC principles (recommendation 9.1) refer to the importance of both *ex ante* and *ex post* evaluation. In turn, the Commission's suggested improvements to the sector-wide *ex post* evaluation process could also assist RDCs in designing their *ex ante* evaluation protocols.

RECOMMENDATION 9.7

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 continue 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).

Through the CRRDC, the RDCs should continue to explore means to increase the robustness of this evaluation process, including through a greater emphasis on revisiting past evaluations to assess whether assumptions about such things as adoption rates and additional extension-related costs have proved to be reliable.

For the time being, the program-wide evaluation process should continue to be on an annual basis. However, if based on the advice of the CRRDC and the Department of Agriculture, Fisheries and Forestry, the Minister is satisfied that the benefit–cost tradeoff is such as to justify a less-frequent timeframe, that timeframe should be adjusted accordingly.

Independent performance reviews

As noted earlier, IOCs are currently required to commission regular independent performance reviews. Several participants suggested that the requirement 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 similarly 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, recommendation 9.1 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. But to ensure consistency across industries, and that important matters are not overlooked, some prescription of review content would be warranted. Specifically, and consistent with the proposed RDC principles, the independent assessments should have regard to: the research balance in an RDC's project portfolio, whether the RDC is collaborating appropriately with other RDCs and relevant parties, the extent to which research is being adopted, the scientific merit of the research (box 9.6), and whether results have been made sufficiently accessible to all levy payers and other researchers.

In its draft report, the Commission recommended that independent performance reviews occur on a three-year basis. However, many participants commented that this was too frequent, with a longer review cycle commonly advocated. For example, the Cotton RDC was one of several to argue that 'the reviews be held every five years ahead of and informing the preparation of each subsequent five-year strategic R&D Plan, to maximise the utility of the review' (sub. DR248, p. 10).

Similar to project evaluations (discussed above), the more frequently performance reviews are required, the greater the administrative costs to the RDCs. As the Horticulture Taskforce observed, 'increased reporting requirements will inevitably increase overheads which will, in turn, reduce the pool of funds available to undertake research' (sub. DR283, p. 20). A further consideration is that changes in performance, for better or for worse, often occur very gradually. In these circumstances, the value of more frequent performance reviews may be limited.

At the same time, the reason for performance reviews is to ensure that each RDC is accountable to stakeholders. Such accountability is essential to the health of the RDC system. If performance reviews are held too infrequently, the incentives for RDCs to perform effectively will be diminished and, consequently, confidence in the system may be eroded.

In light of these considerations, the current three-year cycle under which many of the IOCs operate does not appear unduly burdensome. Nonetheless, the Commission recognises that the appropriate review timeframe will likely vary

Box 9.6 **Evaluating the scientific merit of RDC research**

As noted in the discussion of project evaluation requirements above, the Commission sees value in complementary assessments of the scientific merit of research. Among other things, this would provide a means to test 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. Such assessment may be particularly relevant for strategic, 'blue sky' research where, given its generally longer-term focus, projects with poor grounding in science may be pursued over an extended period of time with little credible prospect of returns ever being realised.

Some participants contended that there could be significant practical limitations to a robust scientific peer review process. For example, MLA's general manager for client and innovation services observed that, given the broad portfolio of projects across the red meat and livestock RDCs, no one adviser would be able to comment on the scientific merits of their research (trans., p. 821).

But the Commission envisages that the role of scientific peer reviews would primarily be to ensure that appropriate research standards are being maintained over time — not to examine the detailed science of every RDC project. This intention is reflected in the Commission's recommendation that the review occur as part of the independent performance review process, rather than as part of the annual project evaluation regime. Such an approach would also mirror an equivalent process adopted by the Department of Innovation, Industry, Science and Research for the Cooperative Research Centres, which requires those organisations to commission an independent peer assessment of whether their research is of 'high quality' in a scientific or technical sense (DIISR 2008). The requirements governing the selection of persons for CRCs' scientific peer assessments would likewise be germane to the peer review process that the Commission is proposing for the RDCs.

somewhat across industries and organisations. To this end, it now proposes that each RDC should undertake an independent performance review every three to five years, with the precise timeframe to be agreed with DAFF. Where performance concerns are present, the option would be available to the Minister to mandate a more frequent review cycle for the RDC concerned (see below).

Review independence

To ensure the integrity of the performance review process, it is important that reviews be conducted in a genuinely independent manner. Currently, IOCs are required under their SFAs to reach agreement with DAFF on the terms of reference for any performance review, and who the reviewing organisation should be. Additionally, some SFAs limit which organisations can be considered

'independent', based on their dealings with the RDC over the past two to three years. AWI's SFA includes a reasonably typical condition:

> The organisation engaged to carry out the Performance Review must be an organisation that has not, within the previous 3 years, carried out any corporate governance reviews, audits or similar reviews of the Company (but this does not prevent an organisation that has merely carried out evaluations of specific projects or the Reviewing Organisation from being so appointed). (s. 16.4)

The Commission received only limited commentary on the efficacy of these particular conditions, although MLA's managing director remarked that excluding reviewers on the basis of previous corporate work substantially limited the pool of entities able to conduct a performance review (trans., p. 818). Moreover, an organisation that has worked closely with an RDC will likely have a better understanding of how it operates compared to an entity with no relationship.

Equally, a 'close' organisation will usually be less capable of acting independently. Hence, while they may have a more intimate understanding of the RDC's operations, they could also be less inclined to reveal those details (and any underlying weaknesses) so as not to compromise that relationship — and the flow of ongoing work and funding that it produces.

On balance, the Commission considers that the current requirements relating to the independence of reviewing organisations are broadly appropriate — and would be so for the statutory RDCs under the proposed extension of the requirements for independent performance reviews to these entities.

RECOMMENDATION 9.8

The Primary Industries and Energy Research and Development Act 1989 (Cwlth) should be amended so that each statutory Rural Research and Development Corporation (RDC) is required to commission an independent performance review every three to five years. Similarly, statutory funding agreements should continue to require that each industry-owned RDC commission an independent performance review every three to five years.

- ***The precise frequency and scope of review for each RDC should be agreed with the Department of Agriculture, Fisheries and Forestry.***
- ***However, every review should explicitly examine the performance of the RDC concerned against the principles articulated in recommendation 9.1, and should also consider the scientific merit of that RDC's research portfolio.***
- ***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 RDCs by the Government will continue to be very important under the Commission's proposed funding reforms. Although government funding for the industry 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.

To this end, the principles in recommendation 9.1 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 need for improved performance assessment has also been endorsed in the draft National Strategic Rural Research and Development Investment Plan (Rural Research and Development Council 2011).

Significantly, the Commission's strong impression is that past government monitoring of the RDCs has often been inadequate.

- 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 (until late 2010) there had not been a Parliamentary Secretary sitting between the RDCs and Minister for several years, has not helped in this regard.
- DAFF was unable to furnish anything more than very basic program-wide data on the RDCs' activities or their funding and spending role within the broader rural R&D framework.

In the draft report, the Commission therefore proposed that DAFF should be required to produce annual monitoring reports for the RDCs as a group. Specifically, it indicated that these:

- should draw on each RDC's annual report and audited accounts
- contain 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
- provide a broad overview of research undertaken and associated outcomes.

The Commission further proposed that:

- if an RDC breaches 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

- there should be summary information on the time taken by DAFF to implement any requested changes to R&D levies during the monitoring period (chapter 10).

Participants' views and the Commission's assessment

While expressing qualified support for a consolidated monitoring report, DAFF (sub. DR266) raised two general concerns. First, it argued that preparation of such a report could be costly and resource intensive. Second (and related to the first point), it considered that annual reporting would be too frequent, with a three-year monitoring cycle being more appropriate.

Several participants similarly raised concerns that such a monitoring report could indirectly impose additional reporting burdens on the RDCs, to the detriment of genuine research. For example, the National Farmers Federation cautioned that a new reporting requirement:

> … has the potential to increase administrative costs for the Rural Research and Development Corporations if DAFF seeks to pass the onus of this reporting back …. (sub. DR230, pp. 7–8)

For its part, the Commission readily acknowledges that there would be costs for DAFF associated with enhanced monitoring and reporting requirements. Effective monitoring necessitates an appropriate resource commitment.

That said, the additional costs of giving effect to the draft report proposal would not seem to be particularly large against the resulting benefits — both in terms of the consolidated information on the RDC program that would be publicly available and the discipline it would place on DAFF to be diligent in regard to its monitoring responsibilities.

The fact that much of the information that would be required is already published in other forms would further serve to contain the impost on DAFF. For instance, an overview of the outcomes achieved for the RDC program would not require a detailed assessment of each and every project. Rather, it could draw from the RDCs' annual reports, as well as the information available from the sector-wide evaluation regime and independent performance reviews. Any additional assessment to verify the general accuracy of these other sources might be as straightforward as DAFF checking with a cross-section of stakeholders that the reports correlate with their practical experiences. Again, this would seem to be no less than should be required of DAFF in its stewardship role.

Likewise, if the proposed monitoring process is undertaken sensibly, there should be little or no added ongoing cost for RDCs. There may be a one-off cost in developing some information reporting protocols to facilitate the presentation of consolidated data. Yet here too, the Commission does not see this as being unreasonable. In fact, such standardised processes may be to the advantage of the RDCs, particularly for the purposes of performance benchmarking. The CRRDC's (sub. DR260) suggestion that DAFF and the RDCs agree on a common methodology for reporting sector performance would be helpful in this context.

RECOMMENDATION 9.9

The 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 recommendation 9.7) and independent performance reviews (see recommendation 9.8), and contain:

- ***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 recommendation 10.3).***

Decisive action and sanctions to address under-performance

As was widely acknowledged by participants, effective monitoring needs to be complemented by credible enforcement when problems are identified.

To signal the general importance of resolving any performance problems quickly and effectively, the principles in recommendation 9.1 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 performance concerns raised at AWI (see below) have illustrated that the effectiveness of the sanctions available to the Minister to deal with unremediated breaches of obligations by an RDC is open to question. Short of withdrawing funding, policymakers' options are mainly limited to even closer scrutiny of the RDC concerned and more onerous reporting requirements — an approach unlikely to guarantee that problems are promptly resolved. Conversely, the more draconian approach of withdrawing funding would effectively penalise an industry for the failures of an RDC that rural producers are compelled to continue funding (at least until such time that they can amend levy rates). There would also be flow-on consequences for research providers, which would be an especially unfortunate outcome where the quality of research outputs is generally well regarded.

The absence of an effective 'intermediate' sanction to forestall the need for the more extreme option of withdrawing funding may inhibit policymakers from acting to resolve critical performance issues. The Commission therefore gave consideration to various intermediate options, and sought further input through its consultations following the draft report's release (box 9.7). But after working through the consequences of the various options, it concluded that these would unlikely be effective, or would be no less problematic than a full funding withdrawal.

The Commission was not alone in reaching this conclusion. Indeed, many participants argued that the provisions available under the PIERD Act and SFAs already provide adequate scope to promote desired performance outcomes — or could do so were DAFF to make more effective use of those provisions. Specifically:

- The PIERD Act states that 'the Minister may give to [a statutory RDC] written directions as to the performance of its functions and the exercise of its powers' (s. 143 (1)).
- Provisions to direct conduct have been introduced into SFAs for IOCs. Although there is variation in the terms, the Government commonly reserves the right to reduce, suspend or terminate funding to an IOC, or to terminate the SFA in its entirety. In addition, AWI's new SFA contains an explicit clause allowing the Government to direct how funds are spent. The ability to require a renegotiation of an SFA (through termination of an agreement) implicitly provides a similar condition for other IOCs.

Another approach, particularly where professional misfeasance is suspected, could be to require that an RDC be formally audited. Under the *Commonwealth Authorities and Companies Act 1997* (Cwlth), a statutory RDC's financial accounts may be reviewed by the Auditor-General. SFAs similarly allow for the

Box 9.7 **Potential new sanctions and performance-linked mechanisms**

The Commission examined a variety of possible intermediate sanctions as a stepping stone towards withdrawing funding for an under-performing RDC. As well as the option floated in the draft report of initiating a board 'spill' — replacing those directors who presided over the identified under-performance, while allowing the RDC concerned to continue operating — such sanctions could include:

- partial withholding of funding, or temporarily redirecting funding to another entity (Australian Beef Association, sub. DR272; John Angus, trans., pp. 151–60)
- negotiation and arbitration, which would bring together the RDC, government and relevant industry representatives (NSW Farmers' Association, sub. DR224; AWI, sub. DR232)
- investigation through an ombudsman or parliamentary committee (Pastoralists and Graziers Association of WA — Livestock Committee, sub. DR228).

However, while such options would be relatively easy to implement for statutory RDCs through the PIERD Act, any new rules for IOCs would require negotiation through SFAs and potentially require shareholder-approved changes to the constitutions of those entities. If shareholders rejected constitutional changes, this again would force the Government to consider funding withdrawal.

In any event, the Commission is unconvinced that the negotiation and investigation options in particular would be helpful. Presumably DAFF and an under-performing RDC would already be in discussions, and both would also have some engagement with industry representatives. Mandating talks would not transform this relationship. Likewise, general third-party investigations (as distinct from a specific audit of an RDC's financial accounts — see text) would not necessarily uncover anything different from independent performance reviews. And for any serious issues that emerge between such reviews, DAFF already has scope to intervene.

Auditor-General to investigate an IOC that the Government suspects is in breach of its funding conditions. Related to this, DAFF (sub. DR266) identified that under both the Commonwealth Authorities and Companies Act (for statutory RDCs) and the Corporations Act (for IOCs), directors may be liable for fines or imprisonment for failing to appropriately discharge their duties — although under-performance is not necessarily indicative of corporate misconduct.

Collectively, these provisions seemingly give DAFF the scope to become an increasingly demanding stakeholder if performance problems are not addressed. In the Commission's view, it is entirely appropriate that DAFF impose an escalating reporting burden on an under-performing RDC, supplemented — where appropriate — by the external auditing powers. Such an escalating reporting burden should at least convey to the RDC concerned the gravity of the concerns about its performance.

More specifically, there could be merit in instituting the sort of interim performance review mechanism employed following AWI's unsatisfactory 2009 performance review, with the company's SFA requiring a follow-up review that was conducted in 2010. While this would see some additional levy payers' funds diverted for administrative purposes, the impact on R&D investment would be much more modest than if government funding were withdrawn. In fact, expenditure on more onerous reporting requirements could itself increase the pressure from levy payers for the RDC concerned to address its performance problems.

Ultimately, if escalating the pressure on an under-performing RDC board proves insufficient, then the Government should be prepared to partially suspend or fully terminate its funding support for that RDC. However, provided DAFF becomes an appropriately demanding stakeholder — using the powers already at its disposal — it should generally be possible to avoid such an outcome.

RECOMMENDATION 9.10

To motivate an under-performing Rural Research and Development Corporation (RDC) to remediate problems identified in an independent performance review (recommendation 9.8), the Department of Agriculture, Fisheries and Forestry (DAFF) should employ an escalating series of monitoring and reporting mechanisms. These should draw on the existing provisions available to DAFF, including to:

- ***require an interim follow-up performance review within 12 months***
- ***initiate a formal audit of an under-performing RDC by the Auditor-General***
- ***invoke its powers under the Primary Industries and Energy Research and Development Act 1989 (Cwlth) to direct the conduct of a statutory RDC***
- ***apply the provisions in statutory funding agreements enabling it to impose conditions on how, and for what purposes, funds can be spent by an industry-owned corporation.***

If, after a reasonable period of time, it becomes clear that non-pecuniary sanctions have not been sufficiently corrective, then the Australian Government should partially or fully withdraw its funding for the RDC concerned.

Specific concerns at Australian Wool Innovation

While this is an inquiry into the RDC regime as a whole, AWI provides a useful case study of the efficacy of current enforcement mechanisms.

In terms of the suite of escalating sanctions available to DAFF, AWI is essentially at 'stage two'. As noted, there has been an interim performance review

(GHD 2010), which has indicated that progress is being made in key areas to rectify the problems raised in the last 'standard' independent performance review (Arche Consulting 2009). Moreover, AWI is voluntarily undertaking to conduct another interim review in 2011. These developments are encouraging.

However, it is by no means clear at this early juncture that all AWI's performance issues are being effectively addressed. Despite the positive developments, there are still some causes for concern.

- AWI's board has not engaged directly with this inquiry. Given that AWI's board structure and operation has been at the core of criticism about AWI's past performance, this is somewhat surprising.
- Although a common criticism of AWI's board is that it exhibits an insufficiently diverse and appropriate range of competencies, AWI's new SFA only requires the company to 'aim' for a skills-based board (s. 4.1). Full details of how the SFA will be given specific effect remain to be seen, with the question arising as to what changes to the company's constitution may be needed if the existing voting system continues to result in what Arche Consulting (2009) identified as a 'factionalised' boardroom.

The Commission is hopeful that AWI can satisfactorily address what have been very long running concerns, which have seemingly damaged confidence in the RDC model as a whole. But in the event that performance improvements stall, the leniency that has been afforded to AWI in the past should not continue indefinitely in the future. Accordingly, and consistent with recommendation 9.10, if the next regularly scheduled performance review of AWI (due in advance of the 2012 WoolPoll, under the current three-year cycle) indicates that the company's remedial actions have been ineffective, then the case for the Government to escalate sanctions — and potentially to withdraw its funding for the corporation — would become compelling.

10 Levy arrangements

Key points

- 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.
- In industries where an RDC is responsible for undertaking both research and marketing functions, it should be up to the levy payers concerned to decide on whether there should be separate levies or a combined levy, and on how much scope there should be for the RDC Board to reallocate funding between research and marketing without seeking formal approval from levy payers.
- Preparing proposals for new levies or changed levy rates is unnecessarily time consuming and costly for industries. The Department of Agriculture, Fisheries and Forestry's (DAFF) current review of the Levy Principles and Guidelines document should look at all avenues that could help to ensure that the burden of complying with the Levy Principles is commensurate with the nature of the proposed levy changes.
- DAFF should, in future, seek to implement new or changed levies within six months of receipt of a properly prepared and documented proposal.
- The Levies Revenue Service in DAFF should continue to monitor its performance and the costs of collecting levies, and communicate to stakeholders the results of that monitoring.
- Although some processors pay statutory R&D levies, there is no strong basis for extending such processor levies to other industries.
- New restrictions should be placed on the eligibility of voluntary contributions for the matching government contribution, to prevent subsidisation of research designed specifically or primarily to benefit an individual entity.
- While it would be counterproductive for RDCs to try to precisely calibrate their research portfolios with the regional distribution of levy payments, if those research portfolios do not deliver benefits for all levy payers over time, ongoing support for the levy system and the RDC model could be put at risk.

Most of the Rural Research and Development Corporations (RDCs) receive at least half of their funding from levies collected from 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. In the draft report, the Commission gave consideration to whether there would be benefit in greater standardisation of levy bases and also of whether there is any reason to strongly prefer statutory levies over voluntary collection arrangements. It concluded that value and volume based levies each have pluses and minuses, as do statutory and voluntary levies. Furthermore, the current arrangements are well understood in each respective industry, with participants expressing no appetite for change. Accordingly, the Commission is not making any recommendations in these areas.

Instead, it has focused on changes to streamline the levy setting and adjustment process, with the intention of making it easier and less costly for industries to increase their contributions in response to additional opportunities for profitable investment in research. The Commission sees this as important to complement the changes it is proposing to the broad RDC funding arrangements which envisage primary producers taking greater responsibility for funding industry-focused research within the model.

10.1 Some more detail on levy arrangements

Establishment and collection of levies

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.

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).[1]

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 of levy revenue raised (DAFF 2010a).

[1] 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.

Creating or changing levies

Step 1: Demonstrate compliance with the Levy Principles

DAFF requires proposals for new statutory levies or changes to existing levies to satisfy its 'Levy Principles'. The principles are expressed in quite general terms, so DAFF also publishes a document called *Levy Principles and Guidelines*, which provides more detail to explain what is required to fulfil them (DAFF 2009).

The principles require industry bodies to demonstrate that the proposed levy addresses a market failure and is equitable, efficient and supported by the industry. DAFF strongly encourages industry representative bodies to use electoral commissions to conduct producer polls for demonstrating support for a proposed new levy or a changed levy rate.

As many participants noted, introducing or changing a levy can be very expensive. The process typically requires significant advertising and mail out campaigns articulating the various arguments for the levy or change in its rate, as well as extensive consultation with the relevant industry constituencies. 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 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.).

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 a few months, it can often take more than a year (DAFF, pers. comm.).

Review of levy rates

Possibly due to the time and effort required to adjust levy rates, such changes are relatively uncommon. Indeed, some rates have not changed since the current levy system was introduced in 1989. 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, unlike other levy paying industries, the dairy and wool industries pay a single levy that can be used for either R&D or marketing — see section 10.2.)

The application of the *Legislative Instruments Act 2003* (Cwlth) will require levies in other industries to have been reviewed by 2016, and every ten years thereafter. For many of these industries, this will increase the frequency with which levy rates are formally reviewed and voted upon.

More generally, 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. To help ensure that levy rates are adjusted if changing circumstances so dictate, the Commission is proposing that as part of the proposed new annual monitoring report, DAFF comment explicitly on levy review plan matters (see recommendation 9.9).

10.2 Improving the levy system

As discussed earlier, the Commission has focused on a small number of specific changes that would make it easier for levy payers to adjust their contributions and/or improve the efficiency of the levy setting and collection process more generally.

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.

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 higher than the current levy rates.

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.

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 then statutory maximum of 10 cents per chick. The enabling legislation was not introduced into Parliament until May 2010, and only received royal assent and amendment to the appropriate regulations in February 2011, two years 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).

As noted, 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.

RECOMMENDATION 10.1

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

R&D and marketing levies

As discussed in section 10.1, 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.

There are at least two possible advantages from having a single levy for both R&D and marketing.

- A single levy could increase administrative efficiency, allowing some of the fixed costs for industries in determining levy rates to be spread across a wider levy base.
- It may also increase an RDC's scope to expeditiously 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.

This raises the issue of whether the single levy approach should be extended more widely. Currently, such an extension would only be applicable to industry-owned RDCs. However, under the Commission's proposal that statutory RDCs (other than Rural Research Australia) be allowed to take on marketing functions (see recommendation 9.3), the issue would become relevant across the model as a whole.

Participants responding to an invitation in the draft report to comment on the benefits and costs of combined levies were strongly divided on the merits of the approach — especially were it to also involve scope for an RDC Board to reallocate funding between research and marketing without formally seeking the approval of levy payers.

Reflecting the potential administrative efficiencies and flexibility benefits outlined above, some participants saw considerable advantages in the approach.

However, others argued that there are transparency benefits in maintaining a clear separation of R&D and marketing levies, and were concerned that allowing RDC Boards and/or levy payers to more easily switch funding between R&D and marketing would see marketing expenditure, with its more immediate returns, favoured at the expense of R&D. The Sugar RDC went on to suggest that frequent shifts in funding between R&D and marketing would necessitate more temporary appointments of scientists, and thereby jeopardise longer term research capacity. Also, DAFF said that while the approach would increase flexibility for RDCs, there would be a need for specific accountability and transparency mechanisms to ensure the integrity of levy allocation decisions. In a similar vein, several participants said that re-allocations should only be permitted where formal approval was given by levy payers.

For its part, the Commission considers that there is certainly no reason to preclude combined R&D and marketing levies, or the movement of levy funds between the two uses by an RDC Board, provided this flexibility had been agreed to by levy payers.

Moreover, even if greater input from levy payers in switching decisions were considered to be intrinsically desirable, this need not necessarily involve resorting to formal levy change processes. For example, as the Grape and Wine RDC noted, the strategic planning process would provide a means to guard against any shifting of funds that could be inappropriate from levy payers' perspective.

> The rural RDCs should be able indicate in their research plans what the forecast split is going to be, which will require sign off by their peak bodies anyway. This would abrogate the need to seek the formal approval of levy payers. (Grape and Wine RDC, sub. DR229, p. 10)

Equally, the benefits of permitting an RDC to move levy funds between R&D and marketing would depend on the quality of the RDC's board and management, and the effectiveness of its governance arrangements.

Ultimately, in the Commission's view, these should be decisions for levy payers in each industry to make, rather than prescribed on a one-size-fits-all basis. Such an approach would again be consistent with maintaining the flexibility that is one of the strengths of the RDC model.

FINDING 10.1

In industries where an RDC is responsible for undertaking both research and marketing functions, levy payers should be free to opt for either separate levies or a combined levy. It should also be up to levy payers to determine the scope for the boards of these RDCs to reallocate levy funding between R&D and marketing without requiring formal approval from levy payers and what other mechanisms might be required to ensure that such reallocations are appropriate.

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 10.1, a number of industries seeking to change a levy rate or create a new levy have found this to be a slow, difficult and costly process. (Other industry groups to comment on the costly and cumbersome nature of the current arrangements included the Winemakers Federation of Australia, sub. 21; Ricegrowers Association of Australia, sub. 24; Citrus Australia, sub. 66; Cotton Australia, sub. 68; Cherry Growers of Australia, sub. 96; Australian Egg Corporation Limited, sub. 119; Australian Fodder Industry Association, sub. DR255.)

The burden of demonstrating compliance with the Levy Principles does not appear to the Commission to stem from the principles themselves. Indeed, verifying that a proposed levy addresses a market failure and is equitable, efficient and supported by the industry is inherently desirable.

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 2009) 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 10.1). A further concern raised by the Grains Council of Australia — Seed Committee (sub. 45, pp. 36–37) was that, in proposing a change to an existing levy, the industry concerned must address matters that were dealt with when the existing levy was first implemented.

Box 10.1 **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 Commission 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 as 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.

DAFF has indicated that it is currently reviewing the Levy Principles and Guidelines document with a view to streamlining the consultation requirements (sub. DR266, p. 16).

Provided that this review looks at opportunities to reduce the burden for industries proposing small changes in levy rates or the reallocation of existing levy funds, and at the case for waiving information requirements where such information has already been provided for other purposes, the Commission sees no need for any further action in this area.

Importantly, input from levy-paying industries on these sorts of issues could materially improve the outcome of the DAFF review. Accordingly, a draft of the revised Levy Principles and Guidelines document should be made available to industry stakeholders as a basis for further consultation with them.

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, some of the examples provided to the Commission seem excessive. As already noted, the egg industry's efforts to increase its R&D levy took two years. And while the passionfruit industry agreed to introduce a marketing levy in late 2007, the levy was not put in place until May 2010, despite it not requiring legislative change (Australian Passionfruit Industry Association 2009).

As a means to help encourage timely processing of levy proposals, in the draft report the Commission argued that there should be an indicative time limit on such processes. Specifically, it suggested that provided proposals contain sufficient detail and supporting evidence, and do not require legislative change, a target of six months would not be unreasonable.

The Commission noted that to consistently meet this time limit, there may need to be some streamlining of the current processes.

- 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 and which are consistent with the levy principles. At the very least, the information provided by levy payers should allow for expeditious preparation of this statement.

The Commission also recognised that there may be circumstances where a six-month time limit cannot be met — including for any proposals that require legislative change. But it went on to argue that in these circumstances DAFF should provide reasons why any proposals are not finalised within six months as part of the proposed new annual monitoring report (see recommendation 9.9).

Not surprisingly, many industry participants expressed strong support for this approach.

Indeed, virtually the only opposition to the proposal came from DAFF. Though it agreed that levy proposals should be dealt with in a timely manner, it contended that because there are many factors outside the control of the Department that influence how quickly proposals are dealt with, an indicative time limit would not be helpful (sub. DR266, p. 16).

As noted above, the Commission is fully aware that there will be circumstances where a six-month time limit cannot be met. This is precisely why it is proposing an *indicative* limit, not a binding maximum limit. Such an indicative limit would provide a clear signal to DAFF and its Minister of the importance of timely processing, while still providing scope for a longer timeframe where the particular circumstances make this unavoidable. Indeed, for the same reasons, indicative limits and associated reporting requirements for administering agencies are used in a number of other regulatory contexts. The arrangements applying to Australia's anti-dumping system are a case in point.

Accordingly, the Commission sees no reason to change its position on this matter.

RECOMMENDATION 10.2

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 Rural Research and Development Corporation program (see recommendation 9.9), the 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 10.1, LRS operates on a cost recovery basis, charging industries for levy collection. Costs are 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) in 2008-09.

Though there were some concerns about collection costs — especially from smaller industries (see Peasley Horticultural Services, sub. 13) — such concerns were not widespread. Moreover, LRS is currently developing a new cost recovery model for levy collection which the Commission would expect to take into account any legitimate industry-specific collection cost issues (DAFF, sub. DR266).

However, the transparency of LRS's past activities, and the extent of its communication with levy payers, appear to have been more of an issue. Against this backdrop, in the draft report the Commission suggested that:

- Reports published by LRS should be augmented with information on levy collection costs and proposed changes to procedures or cost allocation protocols that would affect the future distribution of such costs.

- LRS could seek feedback on the effects of, and levy payer satisfaction with, the introduction of Levies Online (a new system for online lodgement of levy returns). The Commission noted that such reporting could in turn be an input into the proposed broader monitoring report on the outcomes of the RDC program as a whole (recommendation 9.9).

Again, these suggestions were welcomed by many industry participants. In keeping with the thrust of these suggestions, DAFF noted that the results of the new LRS cost recovery model would be communicated to stakeholders — though it contended that '… reporting details of all changes to operating procedures [in the proposed annual RDC monitoring report] would be unnecessary duplication of the [LRS annual] report to stakeholders' (sub. DR266, p. 16). The Australian Lot Feeders' Association (sub. DR207) similarly had reservations about imposing extra reporting burdens on the LRS, presumably on the grounds that they might be passed onto levy payers in the form of higher collection fees.

The Commission agrees that such duplication of reporting effort would serve little purpose. Hence, unless the annual LRS report were to be appended to the proposed broader monitoring report on the RDC model, reference to the activities of LRS in the broader report should be in summary form only. What is important, however, is that through its reporting process and other communication channels the LRS is actively engaged with levy payers, with that engagement underpinned by appropriate internal performance monitoring. Without such engagement and performance monitoring, there are likely to continue to be unhelpful concerns about LRS and the efficiency of its collection process.

FINDING 10.2

It is important that the Levies Revenue Service continues to monitor its performance and the costs of collecting levies, and communicates the results of that monitoring to stakeholders via its Annual Report and other appropriate communication channels.

10.3 Should levies be imposed on processors?

As noted in chapter 2, in several rural industries, processors pay R&D and marketing levies and therefore directly contribute to the cost of R&D and other services provided by RDCs.

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; Australian Southern Bluefin Tuna Industry Association, sub. DR175). More specifically:

- DAFF (sub. 156) suggested that processor levies could stimulate increased investment in rural R&D.
- Some participants expressed support for processor levies based on notions of fairness (see Low Rainfall Collaboration Project, sub. 14; Australian Centre for Plant Functional Genomics, sub. 15; Australian Academy of Technological Sciences and Engineering, sub. 37; Curtin University, sub. DR183).

However, the Commission is not persuaded that there is a case for extending statutory processor levies beyond their current application — recognising that processors can and sometimes do contribute to broadly based rural R&D in other ways, including in some cases through voluntary contributions to RDCs.

In the first instance, the strength of the free-rider argument that underpins the case for levy arrangements in the farm sector seemingly has much less force across the totality of the processing sector.

- 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 et al. 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 2010b).
- Through intellectual property mechanisms or other means, processors can often prevent the use of the outputs of their in-house research by competing firms for an extended period of time.

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 and fruit canning sectors, processors make substantial direct investments in their own R&D (Australian Chicken Meat Federation, sub. 77; Canned Fruits Industry Council of Australia, sub. DR250). Such investment would be unlikely if free riding were a significant issue.

Similarly, even were fairness to be considered a good basis for establishing levy arrangements, levies on processors will not necessarily promote 'fairer' outcomes. Specifically, 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, as noted by various participants, processor levies may well be passed back to producers in the form of lower prices for the primary product. In an industry where primary producers believed that their levy payments were sufficient, the introduction of compulsory processor levies, with subsequent pass

back, 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.

Clearly, the likelihood and extent of such passback will vary across industries. Industries that already have processor levies may differ in their traditions, practices or characteristics from industries which do not have such levies. The Commission has not looked, in this context, in detail at these industries. Rather, it has simply pointed out that pass-back is a real possibility, and if it does occur, fairness would not be advanced.

The preceding arguments also call into question the continued provision of matching government contributions for payments by processors in those sectors where processors do currently pay statutory levies.

As indicated above, the Commission has not looked in detail at these industries, and thus whether its broad concerns about statutory processors levies apply with greater or lesser force in these particular cases. Notably, it did not receive any complaints concerning processor levies from producers or other stakeholders in these industries.

Perhaps more importantly, removing matching contributions for existing processor levies would add to the adjustment pressures that would arise from the Commission's proposed funding changes for the industry RDCs. Accordingly, the Commission considers that this issue would be better revisited as part of the review of the proposed new RDC arrangements (chapter 12). In the meantime, however, it would not be appropriate to introduce any new statutory R&D levies on processors.

FINDING 10.3

There is no strong basis for extending statutory R&D levies on processors beyond their current application.

10.4 Voluntary contribution issues

Voluntary contributions play an important role within the RDC model.[2] As outlined in chapter 2, while these are often provided on a collective industry basis, they can

[2] Also, as noted in chapter 7, any additional research 'imported' into the RDC model in response to the proposed second tier funding incentive could well take the form of some sort of voluntary contribution to the RDCs concerned.

also come from individual growers, processors or other entities as part of the more general voluntary contribution arrangements that apply in some sectors.

Under the current arrangements, there is generally no distinction between these two groups of voluntary contributions as far as matching government contributions are concerned. That is, provided the relevant industry contribution cap has not been reached, voluntary contributions from both industries and individual entities receive the matching government contribution.

In the case of voluntary contributions made on a collective basis, the Commission considers it entirely appropriate that they be eligible for the matching contribution from the government. There is, in a practical sense, little to differentiate such contributions from those made via statutory levies, with the research that is funded intended to be of a collective benefit to the industry. Even if a collective contribution comes from an overseas source there may still be a case for a matching contribution if the benefits to the Australian industry of the research concerned are expected to be large — though the Commission has not investigated the specific instances where such matching contributions have been made.

But where a contribution comes from an individual entity, it is much less likely that the R&D will provide the sort of industry benefits that would justify a significant public funding contribution. In this context, Hunt Partners noted:

> … in some cases Meat and Livestock Australia spend core funds on project studies in members' factories or farms, the benefit of which is retained by that member which naturally is seen by many to give those favoured members an advantage over their competitors. (sub. DR257, pp. 1–2)

As discussed earlier in the report, it will often be difficult to delineate between the public and private benefit likely to attach to a particular piece of research in advance of the event. On this basis, some participants cautioned against ruling out matching government payments for research funded by voluntary contributions from individual entities.

However, as the Commission has emphasised throughout this report, the case for a public funding contribution does not centre on the public-private balance in research benefits as such. What is important is whether or not there are sufficient potential returns for a private party to invest in a project. If there are, then the case for public funding is weak, even if there are subsequently wider benefits for the rest of the industry as the innovation concerned takes hold. Notably, the Horticulture Taskforce (sub. DR283, p. 11) said that the objectives of research funded by voluntary contributions from an individual entity is sometimes designed to reduce the particular entity's costs — that is, to give it an advantage, for a period at least,

over its competitors. The Commission reiterates that in its view the case to provide public funding in these circumstances is weak.

Given this, the question then arises as to how this sort of research could be practically excluded from eligibility for matching government contributions. Even though funding provided by a single entity might sometimes be for research that warrants some public support, providing for this would require either a 'beauty contest' assessment of all funding proposals or a continuation of the current open slather arrangements.

The Commission is therefore inclined to the view that for a project to be eligible for matching funding from the government, a minimum of two non-associated parties should be making a financial contribution. (This requirement would be satisfied where an industry body collects funds from at least two producers, and then invests the funds on their behalf.) As well as providing a ready basis for determining funding eligibility, a requirement for an individual entity to seek at least one co-investor should of itself minimise the likelihood that government contributions will be inappropriately used to subsidise entity-specific research.

As an additional safeguard, and in keeping with the principles outlined in recommendation 9.1, matching contributions should be precluded for projects that are subject to commercial-in-confidence provisions (such as those highlighted by Hunt Partners, sub. DR257, p. 2) which prevent disclosure of research output for any longer than is needed to apply for agreed intellectual property protection.

RECOMMENDATION 10.3

Voluntary contributions to Rural Research and Development Corporations should only be eligible for matching government funding if the following conditions are satisfied.

- ***At least two non-associated entities — whether directly or through an industry body — have made a financial contribution toward the cost of the research concerned.***
- ***There are no commercial-in-confidence provisions precluding general disclosure of the outcomes of the research for any longer than is needed to apply for agreed intellectual property protection.***

10.5 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 few 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. 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 in this area included the Department of Agriculture and Food Western Australia, sub. 137; Grain Industry Association of Western Australia, sub. 143; Evergreen Farming, sub. 152; Curtin University, sub. DR183; Vegetables WA, sub. DR249.)

At the same time, some 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.) Also, it would seem to the Commission that there has probably been some conflation of concerns about past and prospective rationalisation of where research is performed and concerns about the perceived regional distribution of research benefits.

The Commission further notes that several RDCs go to considerable lengths to take differing regional research needs into account in developing their research portfolios. For instance, 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. Indeed, going beyond this sort of approach and trying to more precisely 'regionally fine-tune' research portfolios (as suggested by Curtin University, sub. DR183) could be costly if that required a shift in investment towards projects that were expected to provide a lesser overall return. Similarly, 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 broader community.

That said, without a reasonable regional distribution of research benefits, producer dissatisfaction in 'under-provided' regions could lead them to vote to reduce (or even discontinue) levy payments, thereby threatening the future viability of the model. Therefore, this is an issue that all RDCs need to be cognisant of.

FINDING 10.4

Especially over short time periods, it would be counterproductive for RDCs to try and precisely calibrate the expected regional distribution of benefits from their project portfolios with the regional distribution of levy payments. However, over time, if RDCs' research outputs do not deliver benefits to all levy payers, ongoing support for the levy system and the RDC model could be put at risk.

11 Some broader framework issues

Key points

- There is a paucity of reliable data on funding and spending flows across the totality of the rural R&D framework.
  - The Department of Agriculture, Fisheries and Forestry should undertake a scoping study to determine how this data might be cost-effectively improved.
- Deficiencies in the coordination of individual rural R&D funding programs diminish the benefits for primary producers and the wider community.
  - To complement current framework-wide initiatives, there should be a 'low key' coordination initiative within the Australian Government to help ensure that its multiple funding programs are consistent and appropriately integrated.
- Where leveraging of rural R&D funds is motivated solely by opportunities to shift the funding burden onto other parties, there will be no benefit to the community to offset the costs involved. Exploration of the scope to limit such behaviour without incurring other costs would be helpful.
- The potential for spillover-related market failures to detract from efficient research outcomes does not disappear when the extension phase is reached.
  - Public funding for extension services should be guided by the same additionality principle that should apply to the preceding research and development work.
- Governments should be monitoring Australia's rural research capacities with a particular emphasis on identifying any impediments that would prevent timely adjustments to changing research needs.
- In seeking to encourage additional private investment in rural R&D, it is important that policymakers treat the private sector as an integral part of the overall framework.

In this inquiry, the Commission's focus has been on the RDC arrangements rather than on how to improve the broader rural R&D framework. Indeed, as outlined in chapter 1, given the more general framework initiatives and reviews that are currently in train, a wider focus for this inquiry would have risked significant duplication of effort. Hence, in regard to broader framework matters, the Commission has primarily limited itself to:

- spelling out the appropriate basis for governments to contribute to the cost of rural R&D
- addressing the questions in the terms of reference about total funding for rural R&D and the share of that funding that should be met by governments.

As is evident from the discussion earlier in the report, the first of these two matters in particular has a direct bearing on the efficacy of the current RDC model and of potential means to improve it.

However, several other broader issues have been germane to the Commission's assessments of the model — including, deficiencies in the data on funding and spending flows across the rural R&D framework; shortcomings in the coordination of the multiplicity of individual government funding programs for rural R&D; aspects of funding arrangements for government research suppliers that create incentives for unproductive cost shifting; lack of clarity in the appropriate role for government in regard to extension; and impediments to greater private investment in rural R&D.

Though the Commission is not making specific recommendations on most of these matters, it considers that enunciation of the issues involved is nonetheless likely to be helpful in facilitating future policy making and implementation across the framework.

11.1 Collecting better funding and spending data

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 (see chapter 2). The most commonly cited estimates of total funding for rural R&D have been based on Australian Bureau of Statistics data widely acknowledged to be imprecise in this particular context, with alternative estimates often relying on equally problematic adjustments based on 'informed guesses'. The available data on the relative funding contributions of governments and private parties are similarly imprecise, with little reliable information on how those funding shares may have been changing over time. And framework-wide data on the share of funding directed to each of the main R&D supplier groups is non-existent.

Aided by input from participants, the Commission has made some progress in unravelling the money trail so as to better indentify how much funding is actually available across the framework and how the funding load is distributed between the

primary funding sources. Also, recent work by the Australian Farm Institute (Keogh and Pottard 2011) has added considerably to the information available on private sector investment in rural R&D.

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 attempts to better document funding flows within the framework have highlighted, the assembly of such data is not easy. For example:

- Many economy-wide R&D programs do not collate detailed data on the distribution of program spending on a sectoral basis.
- Notwithstanding the recent work by the Australian Farm Institute, the data on private sector funding for rural R&D remains problematic (see chapter 2).
- Funding support that comes through 'undercharging' for research work by universities, CSIRO, and State and Territory Governments is effectively hidden.
- The extensive leveraging of contributions from other parties means that there is considerable circulation of funding back and forth within the framework (see box 4.1). As well as reducing the transparency of the funding trail, this raises the spectre of double or even triple counting.

More broadly, as a number of participants noted, there is the overarching question of where rural R&D starts and finishes. A particular issue here is the treatment of funding for extension, which is included in some but not all of the currently available data. Also, some of the funding available within the RDC model is used for R&D related to downstream processing — an activity that is typically viewed as falling with the manufacturing sector rather than the rural sector.

However, such difficulties are not a reason to maintain the status quo. Accordingly, in the draft report, the Commission argued that there should be an effort to build on the additional information on funding and spending across the framework that has emerged 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 Council of Rural Research and Development Corporations (CRRDC, sub. 128, p. 56). Specifically, it proposed that the Department of Agriculture, Fisheries and Forestry (DAFF), in consultation with its

State and Territory Government counterparts, be responsible for establishing a process to enable the assembly and maintenance of a more robust funding and spending data base.

This proposal was warmly welcomed by a large number of participants, with various suggestions made about how the exercise might be extended beyond broad funding and spending flows; what measurement conventions should be employed; and how it might draw on 'comparable' data collection processes in other countries.

At the same time, there were some concerns about the difficulties of assembling better data and, more importantly, about the costs of such an exercise relative to the benefits that would arise. DAFF, for example, commented that:

> … assembly of robust funding and spending data across all Australian rural R&D programs is not a simple task. Establishing and maintaining a system to collect such data would be complex and costly. Before expenditure on such an exercise could be justified, a business case would be required addressing the objectives and scope of the project, including a comprehensive needs analysis to identify data that is critical to public policy development and investment decision making, clarifying the data definitions to be used and giving consideration to the relative costs and benefits of the process. (sub. DR266, pp. 14–5)

CSIRO (sub. DR219, p. 2) similarly called for the costs of such an exercise to be evaluated.

For its part, the Commission is not convinced that this data collection exercise would be overly costly. And as for the costs attaching to better project evaluation and more robust monitoring (see chapter 9), the costs of any exercise need to be put in appropriate context. With the order of $1.5 billion apparently invested in rural R&D each year, were a modest investment in better data collection to contribute markedly to better use of that funding, the payoffs for the community could be very large. The Commission further notes that the Rural R&D Council (2011) has similarly recommended that steps be taken to increase data collection 'to support performance measurement of the rural RD&E system.'

That said, improved information on funding and spending flows across the framework would not provide ready made answers to many key policy questions. In particular, as discussed in chapter 6, even with very precise information on funding and spending, judgement would still be required in coming to a view on how much governments should be contributing to individual funding programs. This is why the Commission has rejected the argument that there should no major changes to the RDC model until better funding and spending data is assembled.

More generally, the Commission concurs that, consistent with good policy practice, costs as well as benefits should be reflected in the scope of any new data collection exercise.

Accordingly, the Commission is now proposing that the precise nature and extent of the exercise should be the subject of a scoping study by DAFF as the entity at the national level with primary carriage for rural R&D policy matters. While the details of that scoping study should be left to DAFF, the Commission reiterates that the difficulties and costs of collecting better data are not, of themselves, a reason for living with the current information vacuum — those difficulties and costs must be set against the likely benefits from access to better data. It further notes that:

- The cost side of the calculus should not be limited to expenses for the Australian Government alone. The costs for the States and Territories in marshalling funding data within their respective jurisdictions should be included, as should any initial or ongoing costs for producers.
- While comparability with overseas data — including through concordance with OECD measurement conventions — would have advantages, comparability should not be pursued to the detriment of the usefulness of the data in a domestic context. Hence, the primary focus of the scoping study should be on the benefits and costs of developing a data set that could better inform policy making in Australia.

RECOMMENDATION 11.1

The Department of Agriculture, Fisheries and Forestry (DAFF) should undertake a scoping study to determine how the data on funding and spending flows within the Australian rural R&D framework might be improved in a cost-effective way to better inform future policy making. In doing so, DAFF should consult with relevant stakeholders, including State and Territory Governments, the Council of Rural Research and Development Corporations, farming groups and the Australian Farm Institute. DAFF should finalise and publish this scoping study within 12 months.

11.2 Improved policy and program coordination

Another aspect of the broad framework where there is seemingly scope for considerable improvement is coordination across the various government policymakers and funding providers. Deficiencies in this area are a drain on the benefits derived by primary producers and the wider community from individual funding programs, including the RDC arrangements.

As discussed in the Commission's report on Public Support for Science and Innovation (PC 2007, pp. 362–3), 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 some participants, the Commission sees the possibility of some risks of this nature in the National Primary Industries RD&E Framework initiative (see box 11.1).

There is also a broader risk inherent in this initiative and more particularly in the recently released Draft National Strategic Rural R&D Investment Plan (Rural R&D Council 2011) 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 significant shortcomings. In addition to involving decision making without information that is available to those more closely connected to the markets concerned, it can be difficult for governments to extricate themselves from failed endeavours. And when government is responsible for making most of the key decisions, the accountability of other participants in the system is commensurately reduced.

This is not to suggest that coordination initiatives will necessarily suffer from problems of this nature. In this regard, in responding to the draft report, the Victorian Department of Primary Industries (sub. DR168, pp. 6–7) said that there is adequate scope within the new RD&E framework to redistribute funding if circumstances change. Similarly, the Queensland Government (sub. DR295, p. 6) rejected any suggestion that the framework involves picking winners.

Moreover, any such risks and costs must be set against the benefits of such framework-wide coordination mechanisms. Given the current fragmentation of research effort, the benefits of the National Primary Industries RD&E framework initiative in particular could be considerable. Also, as noted in box 11.1, the likelihood of significant downsides can be ameliorated through appropriate monitoring of outcomes and iteration of the arrangements where necessary.

Indeed, with a view to this sort of benefit–cost tradeoff, the Commission sees value in a '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. Like several participants (for example, Noel Beynon, sub. 6 and South Australian Grain Industry Trust, sub. 11), the Commission's strong

Box 11.1 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)

Also, in an area where state-level and regional outcomes have often loomed large in policy setting, the initiative appears to have 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 some risks over the longer term.

- Despite the inclusion of various cross-sectoral RD&E streams, the initiative seems to the Commission to involve some locking-in of current levels of public funding for the existing suite of rural industries. As CSIRO (p. 24) noted, to the extent that this is the case, it could potentially limit the scope to redistribute public funding to cater for the emergence of higher payoff research opportunities in, say, new rural industries, or in new cross-sectoral areas.
- Though consolidating funding and delivery structures will bring some immediate and potentially sizeable cost savings, 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 strategy potentially risks compromising excellence in research and over time reducing national capacity and outcomes.

Such observations are not to downplay the importance of the initiative, or to ignore the counter arguments as to why the new arrangements will retain sufficient flexibility and responsiveness in the RD&E funding regime. Rather, in drawing attention to some possible risks, the Commission is seeking to reinforce the need to monitor outcomes and for a preparedness to modify the arrangements if there is evidence of any of the inflexibilities outlined above.

impression is that decisions to introduce new programs or adjust funding for particular programs, have sometimes been made without sufficient regard to alternative funding vehicles that may be available, or to what the policy framework as a whole is intended to achieve.

It is of course easy for those on the outside to misdiagnose the causes of coordination problems. Even the most effective coordination mechanisms will not preclude programs or policy decisions driven by the need to respond to short-term political pressures. Also, it is unlikely to be helpful to add 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 oversighting function include the Primary Industries Ministerial Council, the supporting Primary Industries Standing Committee (PISC) and its R&D subcommittee, and the CRRDC.

In the draft report, the Commission therefore suggested that a low key coordination mechanism would desirably draw on existing administrative structures within the Australian Government. Though canvassing the possibility of a standing interdepartmental committee arrangement, coordinated by DAFF, it noted that there were a number of other possible alternatives. Accordingly, the Commission sought further input on what form the new mechanism should take, and also on what the exact scope of its coordination responsibilities should be.

Again, there was considerable support for the broad concept of a new coordinating mechanism within the Australian Government — though among this group of participants there were very different views on what precisely it should entail. Some, such as the CSIRO (sub. DR219), suggested that the new mechanism would be much more valuable were it to formally interact/be linked to the PISC. Indeed, the Victorian Department of Primary Industries (sub. DR168) canvassed the possibility that the new mechanism could supersede the PISC.

On the other side of the ledger, participants such as the PGA–Livestock Committee (sub. DR228) questioned whether a new mechanism was necessary, while others suggested there was potential for such a mechanism to 'lose its way':

> The merit of this recommendation must not be lost by the process becoming a committee-focused administrative burden producing no real benefit for program management and coordination. It doesn't appear to recognise cross-RDC coordinating programs, such as Grain and Graze and the Climate Change Research Strategy for Primary Industries. (A3P, sub. DR235, p. 3)

Fisheries interests pointed out that there are already adequate coordination mechanisms for that particular sector (see, for example, trans., p. 102), while DAFF (sub. DR266) pointed to the existing across-government coordination mechanisms

and to the coordinating role played by the CRRDC. In a similar vein, the Red Meat and Livestock RDCs (sub. DR252) suggested that before implementing any new coordination mechanism, it would be preferable to wait until the recently introduced changes designed to better integrate the framework are properly bedded down, with any residual coordination problems addressed at that juncture.

In a general sense, the Commission remains of the view that some sort of new mechanism would be desirable. With Australian Government funding for rural R&D exceeding $700 million a year, and with that funding spread across a multiplicity of programs, spending a relatively small sum of money to help ensure that the left hand knows what the right hand is doing would seemingly be prudent.

Equally, the Commission is cognisant of the risks of going too far down this track, especially in an environment where important aspects of the policy framework are in a state of flux, with future institutional structures and responsibilities far from settled. Hence it considers that, for the time being at least, the approach suggested by DAFF would be appropriate.

> Notwithstanding [the] existing arrangements, DAFF recognises the need for increased collaboration and information sharing across all relevant Australian Government portfolios on the various aspects of rural R&D investment and reporting. The Coordination Committee on Innovation (CCI) has facilitated the engagement of all Australian Government portfolios with an interest in innovation activities, and DAFF and the CRRDC are active members of the CCI. By establishing a subcommittee of the CCI focused particularly on rural R&D, the existing links could be maintained and built upon, and a better understanding of the broad spectrum of Australian Government investment in rural R&D could be developed. (sub. DR266, p. 15)

This approach would not preclude the use of a 'stronger' mechanism in the future were, for example, the broader framework initiatives to prove unsuccessful in delivering an appropriate degree of funding coordination — though the Commission reiterates that going too far in this direction could have significant costs. The subcommittee would also be easy to establish and could therefore quickly be in a position to provide advice on the scope to beneficially transfer some departmental R&D funding programs into RRA (see section 8.5). As well, it could:

- liaise with other relevant entities such as the PISC on the implications of changes in Australian Government funding programs for the totality of the rural R&D framework and on any associated cross-government or industry-government coordination issues
- be a source of general advice on any systemic coordination issues that require remedial action.

Finally, the Commission notes that while Australian Government funding for fisheries R&D would notionally fall within the subcommittee's purview, given the other coordination mechanisms already in place in that sector, its role in the area would most probably be limited.

RECOMMENDATION 11.2

The Australian Government should establish a subcommittee to its Coordination Committee on Innovation, focused exclusively on rural R&D. That subcommittee should be tasked with:

- ***promoting consistency in approaches across specific and more general Australian Government programs that provide funding for rural R&D***
- ***liaising with other relevant entities — including the Primary Industries Standing Committee of the Primary Industries Ministerial Council — on the implications of changes in Australian Government funding programs for the totality of the rural R&D framework and on any associated cross-government or industry-government coordination issues that arise***
- ***providing advice to the Australian Government on any systemic coordination issues that require remedial action.***

The subcommittee should also provide input to the development of the research remit for Rural Research Australia (see recommendation 8.1).

11.3 Cost shifting

Leveraging — that is, tapping into more than one funding pool to augment the money available for a research project — can have important benefits. As outlined in chapter 4, these include: sharing the costs and risks of an R&D project across intended beneficiaries; catering for projects that would be too big for one entity to fund; and drawing in a wider range of expertise to enhance the quality and timeliness of a project.

Conversely, where leveraging is motivated solely by opportunities to shift the funding burden onto other parties, there will be little or no benefit for the community to offset the potential costs. (As well as the administrative expenses of securing funding contributions from third parties, leveraging can reduce transparency and thereby accountability. More perniciously, as explained in chapter 4, it can potentially shift the focus of research too far towards the needs of the strongest funding partner.)

On occasion, the design of individual rural R&D funding programs may create incentives for unproductive cost shifting or an otherwise excessive focus on leveraging. This is why the Commission's proposed public funding principles (recommendation 4.1) make explicit reference to this issue.

But to a large extent, the scope for unproductive cost shifting within the rural R&D arena arises from:

- the requirement for government research providers such as CSIRO and the universities to augment their core government funding with income from commercially-focused work for, and with, third parties
- the nature of the incentive that is provided for them to do so — namely, funding supplementation for the overhead costs attaching to commercially-focused work. Effectively, this allows these providers to offer commercial research services at marginal cost.

In these circumstances, it would hardly be surprising if entities procuring research sought to take advantage of the opportunities to secure an indirect contribution from the public purse.

As the Commission argued in its 2007 report on Public Support for Science and Innovation, so-called 'dual' funding arrangements 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.
- 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, dual funding regimes for government research suppliers have been widely embraced both in Australia and internationally, with the Commission (p. 515) also concluding that the rationales for them are sound.

Thus, 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.

Nonetheless, the Commission considers that further within-government exploration of these matters would be helpful. In this regard it notes:

- the suggestion from CSIRO (sub. 123) for the development of 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).

11.4 The role of government in regard to extension

As discussed in earlier chapters, provision for adoption of research outcomes does not always appear to have been given sufficient attention in the past, including within the RDC model. The specific references to the importance of adoption in the Commission's proposed general public funding principles (recommendation 4.1) and the proposed RDC principles (recommendation 9.1) are intended to help ensure that adoption issues are more to the fore in the future.

However, the policy issue which then follows is how responsibility for funding extension services should be shared between governments and 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.)

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 instead public funding is viewed as a means to supplement 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 preceding R&D work.

Like the R&D component, applying the additionality principle to extension services will involve judgement, having regard to the circumstances involved. For example:

- While the case for a government contribution is typically likely to 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 is warranted. One example is where the adverse environmental impacts of rural activities cannot be readily attributed to individual producers, making it difficult to ameliorate those impacts through regulation. In these circumstances, and

while 'community licence to operate' considerations might still provide an incentive for producers to investigate more environmentally friendly farming practices, it could nonetheless be in the community's interests to contribute to the cost of farm-level extension services aimed at facilitating practice change.

- 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 detract from efficient outcomes 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.[1]

That said, 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 recommendation 4.1. It also notes that, in an extension context, the Commission's proposed principles do not seem to be greatly different to the principles reflected in a study by Pannell (2008) — referred to by the Cattle Council (sub. DR244) — on the role for government funding in facilitating environmentally sound land use practices in the farming community. As noted above, in this area, the case for government funding of on-farm extension services could sometimes be strong.

It may well be that application of these principles would, over time, reinforce the current trend of placing more onus on private parties to fund extension services, and thereby add to the private sector's overall role within the rural R&D framework (see below). However, with assessment against the additionality principle in particular, that would represent a more considered outcome than reductions in public funding driven by short-term budgetary imperatives — and would most likely involve a different pattern of public investment in extension that provided a greater benefit to the community.

Finally, the Commission observes that there can also be a distinction between government funding for specific extension services and funding to explore any generic barriers that may exist to the adoption of new innovations by producers. In

[1] As discussed in appendix B, the recent Sheng, Gray and Mullen (2010) study suggests that returns from past public investment in extension may have been nearly as great as for the investments in the research itself. But as also discussed in the appendix, for the purposes of this study, it would seem to the Commission that public and private funding would be broadly interchangeable. If this is the case, then these results would relate more to the returns from investment in R&D compared to those from investment in extension, rather than to the public/private delineation as such.

its view, a modest public investment in the latter might well help to enhance future extension policy and thereby increase the value of future government funding for specific services.

11.5 R&D capacity issues

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 elsewhere in the report, 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 about the perceived run down of State and Territory Government research facilities — 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 11.2). Also, as discussed in chapter 7, flow-on implications for future research capacities were one of the arguments mounted against any reductions in public funding for industry-focused research within the RDC model.

Given the focus of this inquiry, and the capacity assessments that are occurring as part of the current broader framework initiatives, the Commission has not examined broad skilling and infrastructure adequacy issues in any detail. Nonetheless, 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 education levels and 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.
- While a heavy reliance on contract employment can detract from job satisfaction and job security and thereby potentially reduce the available pool of researchers (see Chris Penfold, sub. DR167), such effects can be mitigated in various ways. For example, it will clearly be in the interests of those procuring rural R&D to maintain productive long-term relationships with high quality researchers, even if the arrangements for specific projects are governed by shorter-term contracts.

Box 11.2 **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)

AIAST 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).

- 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. 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. Also, RDCs and Cooperative Research Centres provide funding for educational activities.

In the Commission's view, the preceding observations are suggestive of a need for caution in responding to calls for major new investments by governments to 'reinvigorate' rural research capacities. (See, for example, the Rural Research and Development Council's (2011) Draft National Strategic Rural Research and Development Plan.) Indeed, the earlier observations about the risks and likely costs of excessive government direction of the nature of the research undertaken are apposite in this context as well.

That said, in oversighting the policy framework, governments should be monitoring what is happening to research capacities — with a particular emphasis on whether there are any particular impediments to prevent emerging or changing needs being accommodated within a reasonable timeframe. In addition, the speed of policy changes should be sensitive to the implications for the research community and the infrastructure network. This is one of the reasons why the Commission is now recommending a smaller reduction in government funding for industry-focused R&D within the RDC model over the next 10 years than it proposed in the draft report (see chapter 7).

During the course of the inquiry participants also raised some more specific system capacity issues relating especially to the dissemination of past research work and investment in other building blocks for future research — such as gene banks and reference collections of insects and plant and animal diseases and pathogens.

A number of the concerns in these areas would potentially be lessened through application of the disclosure and dissemination requirements in the Commission's proposed general public funding principles (recommendation 4.1) and principles to guide the future operation of the RDC program (recommendation 9.1). And as discussed in chapter 8, the remit of RRA could potentially encompass the sort of system capacity issues referred to above. The Commission further notes that 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. Nevertheless, the scope to build on these sorts of initiatives might usefully be explored by policymakers.

11.6 Facilitating private investment in rural R&D

As outlined in chapter 2, the role of the private sector in funding rural R&D has been increasing in most developed countries. In commenting on this trend, Keogh and Pottard (2011) outline various contributing factors, including: more effective intellectual property protection mechanisms; the emergence of large multinational firms which have the resources and expertise necessary to successfully invest in rural research; technological advances in plant and animal genetics and breeding that have created new opportunities for private firms to generate revenue from innovative developments; and advances in computer technology and scientific analytical techniques that have likewise made it easier for firms to make more rapid progress in developing new varieties and other innovative products.

Consistent with this trend, the Commission considers that there is a strong case for private parties in Australia to progressively shoulder more of the overall funding load (see chapter 4) — although that transition should occur over time. The need for gradualism is another reason for the revisions to the Commission's funding proposals for the industry RDCs (see 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 impediments to it doing so. This is one of the objectives of the Commission's proposals to make it easier for levy paying industries to change the rate of their levies (see recommendations 10.1 to 10.3).

Commentary from inquiry participants, and the survey of potential private investors in rural R&D that has helped to inform the aforementioned paper by Keogh and Pottard, point to a range of other impediments to increased private funding in Australia. Some of these — such as the costs of doing research locally and Australia's limited market size — are part and parcel of the prevailing research and market landscape and are not an appropriate target for policy action. However, there may be greater scope to address some of the other identified impediments such as:

- time consuming and costly requirements for testing and registering new agricultural and veterinary chemicals
- aspects of the arrangements governing the use of genetically modified crops
- particular features of Australia's intellectual property laws impinging specifically upon rural R&D
- the difficulties for private parties seeking to engage in collaborative research with RDCs and government research suppliers to come to agreement on ownership of intellectual property rights.

The Commission notes that action is already in train in some of these areas — for example, the initiatives being progressed by the CRRDC and the PISC R&D Subcommittee to address intellectual property issues pertinent to collaborative investments. In other cases, wider considerations will have a bearing on whether changes that could make private investment in rural R&D more attractive would be of net benefit to the community. For instance, as discussed in chapter 3, health and safety concerns are central to regulations governing the testing and registration of new agricultural chemicals.

More broadly, in seeking to encourage additional private investment in rural R&D, it is important that policymakers treat the private sector as an integral part of the overall framework. Outside of a few particular areas or industry sectors — for example, in plant breeding, agricultural and veterinary chemicals and in the sugar industry — this does not appear to have been the case in the past. 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, with Birchip Cropping Group (trans. p. 844) indicating that there had been little direct engagement with individual producers either. Similarly, the National Association of Forest Industries (sub. DR189, p. 1) expressed concern about the overly heavy influence of government agencies in setting research priorities in that sector.

There is evidence that the current mindset at the policy making level is beginning to change. For example, in its initial submission, the Victorian Department of Primary Industries (sub. 161, pp. 13–4) 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.

But further attitudinal change is required. Without it, affecting a similar shift in mindset across the rural community will be that much more difficult.

12 Impacts and review

Key points

- The key goal of the Commission's recommendations is to help ensure that the community gets a better return from its sizeable investment in the Rural Research and Development Corporation (RDC) model.
- To this end, the Commission's proposals for the future funding of the RDC model seek to: provide for a more appropriate balance between private and public funding responsibilities; incentivise producers to increase their investments in the model; and address aspects of the current funding arrangements that discourage investment in broader rural research.
- It is also recommending some more specific supporting changes to improve the efficiency and effectiveness of the model.
- While the Australian Government's total contribution to the RDC program would most probably decline, it seems unlikely that this reduction — or any ensuing reduction in the total amount of funding available for rural R&D — would be particularly large.
  - Indeed, levy payers would not have to replace a particularly large portion of the reduced government contribution to the industry RDCs to maintain, or even increase, the total amount of public and private funding available across the reconfigured RDC model as a whole.
- But while such indicative funding outcomes are important for putting the Commission's proposals in appropriate context, they are not a good basis for judging the worth of the reform package.
  - The key in this regard is the redistribution of government funding towards research areas where levy arrangements alone are least likely to ameliorate under-investment.
- There is no good reason to delay the introduction of the revised funding arrangements — especially as adjustment concerns are addressed by the recommendation to reduce the cap on dollar for dollar matching contributions from the Government very gradually and introducing the uncapped second tier subsidy immediately.
- After the ten-year phased reduction in dollar for dollar matching support is complete, there should be an independent public review of the impact of the new RDC arrangements.

The Commission has proposed a package of reforms to the Rural Research and Development Corporation (RDC) model. For each of these reforms it has outlined the benefits that would result for the community, as well as addressing criticisms of the suggested approach from participants.

However, the Commission considers it useful to draw together the key elements of those earlier discussions here. Additionally, the chapter discusses when the proposed new arrangements should themselves be reviewed and what that review should encompass.

12.1 What has the Commission sought to achieve?

Consistent with its enabling legislation the Commission's recommendations are intended to promote the interests of the community as a whole.

On this basis, retention of the RDC model is clearly warranted. As outlined in chapter 5, the model has some important strengths and has provided significant benefits to both the rural sector and the wider community. In the Commission's view, it is highly unlikely that any alternative approach (see chapter 6) would deliver as good an outcome.

Even so, the community does not seem to be getting the best return for its very substantial investment in the model. In particular, a considerable proportion of that investment appears to be simply replacing private funding — and thereby subsidising research that producers/industries would otherwise most probably have fully funded themselves — rather than making a genuine difference to research outcomes. Such modest 'additionality' is in turn reflective of deficiencies in the basis on which the Government's contribution to the RDCs is currently provided.

To address these deficiencies, the Commission's proposals for the future funding of the RDC model seek to:

- provide for a more appropriate overall balance between private and public funding responsibilities
- explicitly incentivise producers to increase their investments in the model — one of the major objectives when the RDC arrangements were introduced more than twenty years ago
- address the particular features of the current funding approach that tend to discourage investment in broader rural research.

Specifically, it is recommending:

- a halving over ten years in the cap on the dollar for dollar matching government contribution from 0.5 per cent to 0.25 per cent of an industry's gross value of production
- the immediate introduction of an uncapped, second tier subsidy for industry contributions above the cap at the rate of 20 cents in the dollar
- the establishment of a dedicated, government-funded RDC — Rural Research Australia (RRA) — to sponsor broader rural research.

The Commission is also recommending some supporting changes that are designed to improve the efficiency and effectiveness with which the RDCs and the Government discharge their responsibilities in giving effect to the model. Importantly, most of these changes involve a strengthening of performance monitoring and review mechanisms, rather than prescriptive new one-size-fits-all requirements. As such, they would build on the eminently desirable flexibility in the current model to cater for the differing circumstances of individual rural industries.

12.2 Likely impacts

In discussions on the likely impacts of the Commission's proposed reform package it is probable that there will be a heavy emphasis on aggregate funding outcomes. As detailed below, aggregate funding outcomes are not the only or even the major part of the story — the proposals are directed at improving the efficiency and effectiveness with which funding is deployed within the RDC model and, in particular, helping to ensure that the Government's very sizeable contribution is spent in a way that adds genuine value for the community.

Nonetheless, to put the proposals in appropriate context, it is useful to reiterate what the likely aggregate funding impacts would be.

- Based on current industry output values and levy rates, public funding for the industry RDCs would be some $75 million to $80 million a year lower at the end of the ten-year phase-in of the reduced cap on dollar for dollar matching government contributions.[1]
- But this would be the maximum reduction — if the second tier subsidy had the intended incentivising effect, and producer contributions increased, there would be a smaller overall decrease in public funding.

[1] As noted in chapter 7, this ignores the small funding changes that could ensue from any special arrangements for smaller rural industries falling within the HAL and RIRDC umbrellas.

- In addition, the creation of RRA would bring with it a sizeable new public funding stream for broader rural research.

As discussed in chapter 8, the precise amount of funding for RRA would depend on its yet to be finalised remit. However, the Commission's intention is that RRA would be an integral and major part of the future RDC arrangements with a funding appropriation to match. Thus, while the Australian Government's total contribution to the RDC model would most probably decline, the extent of that reduction would not be particularly large. By way of illustration, were the appropriation for a fully functioning RRA to be of the order of $50 million a year, *and without any response from levy payers to the new second tier subsidy*, total government funding at the end of the ten-year phase-in period would be some $25 million to $30 million a year lower than at present.

In fact, provided it were clear that the new funding arrangements were fixed for at least the next decade, the Commission is very confident that a possibly significant number of primary producers would, over time, be prepared to pay more to help fund research that had the potential to provide them with a sizeable direct financial benefit. Access to the new uncapped second tier subsidy and the continuation of levy arrangements to ameliorate free-rider problems — together with the modifications to make increasing levies easier — would serve to reinforce these commercial incentives.

This in turn suggests that any reduction in the total amount of public and private funding available to the RDCs, including RRA, would be very small. Indeed, it may well be that total funding for the RDCs could increase. Again using a funding appropriation for RRA at $50 million a year for illustrative purposes, levy payers would only have to replace around a third of the reduction in government funding for the industry RDCs to deliver a neutral public-plus-private funding outcome.

As discussed in chapter 7, there are necessarily uncertainties about precisely how levy payers would respond to the proposed funding arrangements. Equally, it is clear that there could be no basis for claiming that those proposed arrangements could put at risk either the future of the RDC model or Australia's overall rural R&D effort. Viewed through an aggregate funding lens, the opposite might well be the case.

That said, such aggregate outcomes are not a good basis for judging the worth of the reform package. Consistent with sound public funding principles (see chapter 4), the Commission has sought to reconfigure the funding arrangements for the RDCs to help ensure that the public contribution makes a real difference to research outcomes. Central to this is the creation of RRA and the consequent allocation of a

greater share of government funding to broader rural research. While levy arrangements are alone unlikely to ensure that all socially valuable, industry-focused research proceeds, it is in the broader rural research arena where the extent of underinvestment is likely to be greatest and where the case for public funding support is therefore most compelling.

Likewise, the benefits from that part of the reform package designed to strengthen the performance disciplines on RDCs and the Government could be significant. In the first instance, with the RDCs currently spending nearly $500 million a year, and with administrative expenses absorbing upwards of 10 per cent of that spending (see chapter 5), even quite modest improvements in their efficiency could free up significant resources for use on actual research. More importantly, improvements to the quality and relevance of research across the RDC model and to the way that research is managed — together with an even greater emphasis on ensuring timely uptake of research outputs by producers — could provide sizeable benefits for both the rural sector and the wider community.

In sum, and while retaining the core elements of a highly worthwhile funding model, the Commission's reform package would help to ensure that the model delivers efficient and effective research outcomes and that the public contribution makes a real difference to those outcomes. While there continues to be uncertainty about whether the community is getting reasonable value for money from its very sizeable investment, question marks over the future of the model will inevitably remain. Viewed in this light, the proposed reform package provides for a set of measured and gradual changes that should help to cement the RDC model as an important and ongoing part of Australia's rural R&D landscape.

12.3 Is there any case for delayed introduction?

Various respondents to the draft report argued that, irrespective of the intrinsic validity of the Commission's suggested reconfiguration of the RDC model, now is not the right time to be making significant changes to the model. For example, several said that any changes should wait until better data on rural R&D funding and expenditure across the framework are available, while others contended that changes should only be made as part of a wider review of the entire rural R&D and innovation framework. More generally, there were suggestions that major changes to the model should be put on the back burner until all of the current environmental and economic challenges facing the rural sector are resolved.

As discussed in chapter 7, the Commission strongly disagrees with these sentiments. As recent and current weather-related difficulties exemplify, the rural sector will

always be facing challenges and pressures of some description. Thus, necessary reforms to the model cannot sensibly be beholden to 'right time' considerations of this nature. In fact, waiting for a period of 'calm' would simply be a recipe for policy paralysis. Moreover:

- Better data would not obviate the need for judgement in determining the parameters of the broad RDC funding arrangements. For instance, no matter how good the data, there will always be a degree of uncertainty about precisely how producers will respond to such funding changes.
- Provided that changes to the model put forward in an inquiry of this nature are consistent with sound public funding principles, they should be little different from the changes that would emerge from a framework-wide review.

It is of course important that change is sufficiently gradual to allow levy payers, RDCs, researchers and other stakeholders to make the necessary adjustments. For this reason, the Commission is proposing that the halving in the cap on the matching dollar for dollar government contribution to 0.25 per cent of GVP occur gradually over 10 years. But with this gradual implementation approach in place — supported by the immediate introduction of an uncapped, second tier subsidy — there would be no good reason to delay the introduction of the recommended changes.

12.4 Review arrangements

The Commission's proposed reconfiguration of the RDC model offers the prospect of a significant gain to the community — especially if primary producers respond to the changes in government funding for the industry RDCs in a way that would seemingly be consistent with their own financial self-interest. Nonetheless, as alluded to above, there is inevitably some uncertainty about precisely how the reform package would play out. Also, changes ensuing from the reform initiatives in train elsewhere in the rural R&D framework (chapter 1) could have implications for the RDC arrangements, over and above the changes proposed by the Commission.

More broadly, in looking to the longer term, the proposed funding arrangements would see industry-focused research within the RDC model still receive very generous public funding support compared to most other Australian industries. Accordingly, the arrangements that the Commission is putting forward for the next 10 years should not necessarily be viewed as the final 'resting point'.

Against this backdrop, and in keeping with a best-practice policy-making process, the Commission considers that provision should therefore be made for an

independent public review of the impact of the proposed new RDC arrangements. In the draft report, the Commission argued that this review would best be conducted at the end of the ten-year phased reduction in dollar for dollar matching government contributions.

Several respondents to the draft report argued that waiting ten years would be too long, suggesting that a five-year review would be more appropriate. In particular, they saw a review midway through the phased reduction in matching dollar for dollar contributions as providing an early opportunity to assess how producers were responding and to identify any unforeseen impacts.

However, as indicated in chapter 7, the Commission considers that a five-year review would be too early. In particular, it would be important that there was ample opportunity to bed down the new arrangements before that review was initiated. Specifically:

- RDCs and their levy payers should have had a realistic opportunity to respond to the changed environment — especially to the proposed second tier subsidy — before the effectiveness of the new arrangements was examined and consideration given to any further changes that might be required. In this regard, and even with the proposed streamlining to the levy change process (see chapter 10), adjusting levy rates in response to the new funding environment would still take time. It could also take time:
  - to break the conditioning effect that the current cap on dollar for dollar matching funding appears to have had on investment behaviour in a number of rural industries
  - for levy payers to fully come to accept that they were to shoulder a greater share of the responsibility for funding research of direct benefit to them.

  An early review could distract from this necessary change in mindset, and even encourage gaming behaviour designed to garner support for a reversion to the previous regime.
- The process of gearing up RRA would take time (see chapter 8), meaning that it would also be some time before its detailed operational interface with the industry RDCs was clarified. And even after five years, it would only be some of RRA's very early research projects which would be coming to fruition.
- Likewise, adjustment of the industry RDCs' research portfolios in response to both the creation of RRA and the changes to their own funding arrangements could not occur overnight.

Accordingly, the Commission remains of the view that a broad-ranging examination of the proposed new arrangements should be left until after the end of the ten-year phased reduction in dollar for dollar matching government contributions. In broad terms, this review should look at the impact of the new arrangements on the level and mix of R&D sponsored through the model — with a particular emphasis on the response of levy payers to the changed funding regime and the effectiveness of RRA in catering for broader rural R&D needs and encouraging uptake of its research outputs by producers.

The review should also address a number of specific matters flagged in this report, including whether all RDCs should be able to fulfil industry representation functions if their levy payers so wish, and whether the Australian Government should continue to match contributions made by processors to RDCs for funding R&D. More broadly, the review would provide an opportunity to look at the implications of changes in the wider rural R&D framework for the future configuration of the model.

RECOMMENDATION 12.1

At the end of the ten-year phase-in of the proposed new government funding arrangements for industry Rural Research and Development Corporations (RDCs) — see recommendation 7.1 — there should be a further independent and public review of the RDC model. Amongst other things, that review should examine:

- ***the responses of levy payers to the changed matching government contribution regime***
- ***the extent to which the changes to the model, 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***
- ***the impacts of the changes to the model on the adoption of research outputs by producers***
- ***the case for making industry representation a generally allowable function for any RDC***
- ***the arguments for and against continuing to provide matched government funding for contributions to the RDCs by processors***
- ***whether the statutory levy rate review requirements have had any effects on the frequency of levy changes***
- ***the implications of changes in the wider rural R&D framework for future RDC arrangements.***

APPENDIXES

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. After releasing the draft report in September 2010, the Commission received a further 132 submissions. (These are denoted in table A.1 with the prefix 'DR'.) All submissions are available online at: 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.
- Following release of the draft report, public hearings were held in Sydney, Canberra, Melbourne, Tamworth, Brisbane, Hobart, Adelaide, Perth and Mildura. The participants at these hearings are listed in table A.3.

The Commission is grateful to all inquiry participants for their input.

Table A.1 **Submissions**

Participant	*Submission number*
A3P	DR235
Academy of the Social Sciences in Australia	26
Across Agriculture	116, 163
Agar, Colin	17
AgForce Queensland	74, DR238
Agricultural Research Development Education and Planning	108, DR180
Agriculture and Horticulture Development Board	146
Agrifood Skills Australia	99, DR188
Animal Health Australia	136
Apple and Pear Australia Limited (APAL)	86, DR282
ATTIA Limited	79
Auscott	5
Australian Academy of Science	35
Australian Academy of Science, Australian Academy of Technological Sciences and Engineering, and the Australian Council of Deans of Agriculture	DR209
Australian Academy of Technological Sciences and Engineering	37
Australian Agricultural Crop Technologies	DR169
Australian Beef Association (ABA)	154, 162, DR272, DR273, DR292
Australian Biosecurity Cooperative Research Centre	29
Australian Buffalo Industry Council	95
Australian Bureau of Agricultural and Resources Economics and Sciences (ABARES)	DR270
Australian Cane Farmers Association	DR247
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 Custard Apple Growers Association	DR225
Australian Dairy Industry Council	135, DR217
Australian Dried Fruits Association, Australian Table Grape Association, Almond Board of Australia, Summerfruit Australia, Murray Valley Citrus Board	DR290
Australian Egg Corporation Limited (AECL)	119, DR261
Australian Farm Institute	DR286
Australian Fisheries Management Authority	41, DR191
Australian Fodder Industry Association	93, DR255
Australian Green Tea	138
Australian Honey Bee Industry Council	7
Australian Institute of Agricultural Science and Technology	12, DR182
Australian Land Management Group	103
Australian Livestock Export Corporation (LiveCorp)	57, DR185
Australian Livestock Exporters Council	121, DR258
Australian Lot Feeders Association	19, 147, DR207
Australian Meat Industry Council	104
Australian Meat Processor Corporation (AMPC)	111
Australian Mushroom Growers Association	155
Australian National University	43, DR221
Australian Native Food Industry	32

(Continued next page)

Table A.1 (continued)

Participant	*Submission number*
Australian Nut Industry Council	49
Australian Olive Association	97
Australian Plantation Products and Paper Industry Council	142
Australian Pork Limited (APL)	117, DR208
Australian Processing Tomato Research Council	DR215
Australian Racing Board	133
Australian Rubus Growers Association	DR184
Australian Seafood Cooperative Research Centre	150
Australian Southern Bluefin Tuna Industry	DR175
Australian Superfine Wool Growers Association	9, DR174, DR267
Australian Wine Research Institute	82, DR240
Australian Wool Growers Association	73
Australian Wool Innovation (AWI)	110, DR232
AUSVEG	DR234
Bacic, Prof. Tony; Hoffman, Prof. Ary and Howlett, Prof. Barbara	DR187
BDA Group	DR165
Beynon, Noel	6
Birchip Cropping Group	84
BSES Limited	42
Bundaberg Fruit and Vegetable Growers	DR246
Bush Goddess Foods	DR237
Campbell, Andrew	DR271
Canegrowers Australia	51
Canegrowers Australia and Australian Sugar Milling Council	DR293
Canned Fruits Industry Council of Australia	DR250
Carbon Coalition Against Global Warming	125
Cattle Council of Australia	83, 149, DR244
Charles Sturt University	DR259
Cherry Growers of Australia	96
Citrus Australia	66
Coles Supermarkets	DR285
Commercial Egg Producers	DR198
Commonwealth Fisheries Association	102, DR239
Composite Group	159
Conservation Farmers	DR170
Cooper, Dr Kath and Elleway, Mike	22
Cooperative Research Centre for Beef Genetic Technologies	62
Cooperative Research Centres Association	DR218
Corporate Agriculture Group	134
Corporate Development Institute	151
Cotton Australia	68, DR220
Cotton Research and Development Corporation (CRDC)	114, DR248
Cotton, Richard	58
Council of Rural Research and Development Corporations (CRRDC)	128, DR260
CropLife Australia Ltd	DR281

(Continued next page)

Table A.1 (continued)

Participant	*Submission number*
CSIRO	123, DR219
Curtin University	DR183
Dairy Australia	130, DR265
Dairy Futures Cooperative Research Centre	78
Davies, Richard	56
Department of Agriculture and Food — WA	137, DR243
Department of Agriculture, Fisheries and Forestry (DAFF)	156, DR266
Department of Employment, Economic Development and Innovation — Queensland	DR295
Department of Fisheries — WA	44
Department of Innovation, Industry, Science and Research	DR289
Department of Industry and Investment — NSW	69, DR274
Department of Primary Industries — Victoria	161, DR168
Department of Primary Industries, Parks, Water and Environment — Tasmania	148, DR193
Environmental Farmers Network	47, DR190
Evergreen Farming	152
Fischer, Tony	25
Fisheries Research and Development Corporation (FRDC)	113, DR231
Forest and Wood Products Australia (FWPA)	139
Forestry SA	71
Forestry Tasmania	67
Gene Ethics	120
Gibson, Prof. Robert	DR166
Gordon, R J	DR269
Goulburn Broken Catchment Management Authority	DR206
Government of South Australia	DR203
Grain Growers Association	160
Grain Industry Association of WA	143, DR254
Grain Producers Australia	DR205, DR212
Grains Council of Australia — Seed Committee	45
Grains Research and Development Corporation (GRDC)	129, DR241
Grape and Wine Research and Development Corporation (GWRDC)	126, DR229
Group of Eight	105
Growcom	122, DR223
High Security Irrigators — Murrumbidgee	16
Hogendoorn, Katja	DR181
Horticulture Australia Limited (HAL)	101, DR200
Horticulture Taskforce	DR283
Huebner, Hans	DR222
Hunt Partners	DR257
Hussey, Dr Karen and Pittock, Jamie	DR294
Hyams, B S and Heatley, R I	DR276
Independent Commodity Services	8
Indigenous Land Corporation	157
Ingram, Robert	DR287
Ingram, Robert; Ingram, Lachlan and Ingram, Braden	98
Irrigation Australia	90, DR262

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Table A.1 (continued)

Participant	*Submission number*
Ive, John	63
Karlsson, John	20
Keller, Dr Michael	DR173
Keniry, Dr John	80
Knott, Edgar	DR280
Landscape Queensland Industries Association	36
Lindsay, David	76, DR176
Loneragan, Owen	DR202
Low Rainfall Collaboration Project	14
Low Rainfall Farming Systems	DR211
Lucerne Australia	46
Macyk, Don	124
Mallee Sustainable Farming	DR288
McGlasson, Dr Barry	DR201
McGregor, Bruce	60
Meat and Livestock Australia (MLA)	106, 158
Mirrabooka Farms	81
Mullen, Dr John	DR172
Murray Valley Citrus Board	31
Nason, Charles	2
National Aquaculture Council	33
National Association of Forest Industries	DR189
National Farmers' Federation (NFF)	109, DR230
National Program for Sustainable Irrigation	70
National Seafood Industry Alliance	144
Native Seeds	10
Natural Resources Management Council	DR268
New Rural Industries Australia	39
New Zealand High Commission	DR263
North and Southern Australian Beef Research Councils	DR279
Northern Territory Seafood Council	30
NSW Farmers Association	145, DR224
Nursery and Garden Industry Australia	87, DR226
O'Brien, Dr John	DR164
O'Donnell, Carol	4
Olsson, Charles	DR277
Onions Australia	DR278
Organic Federation of Australia	DR291
Passioura, John	72
Pastoralists and Graziers Association of WA (PGA) and Western Graingrowers	115, DR245
Pastoralists and Graziers Association of WA — Livestock Committee	DR228
Pearson, Stuart	34
Peasley Horticultural Services	13
Penfold, Chris	DR167
Pistachio Growers Association	DR256
Price, Simon	94

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Table A.1 (continued)

Participant	*Submission number*
Queensland Farmers' Federation	112, DR178
Queensland Government	153
Queensland Murray Darling Basin Committee	52
Queensland University of Technology	18
Ravensthorpe Agricultural Initiative Network	DR253
Red Meat and Livestock RDCs	DR252
Reynolds, CA and HJ	DR233
Ricegrowers Association of Australia	24, DR179
Rice Marketing Board for the State of New South Wales	28
Riverina Citrus	DR216
Riverine Plains	DR264
Rogan, Ian	1
RSPCA Australia	75
Rural Industries Research and Development Corporation (RIRDC)	92, DR275
Schmidt, Gil	127
Scientific Horticulture	DR194
Sheepmeat Council of Australia	100
Sheil, Dr Meredith	DR204
South Australian Farmers Federation	85, DR199
South Australian Grain Industry Trust (SAGIT)	11
South Australian Murray–Darling Basin Natural Resources Management Board	91
South East Asian Livestock Services	132
South East Premium Wheat Growers Association	DR195
Southern Farming Systems	DR171
Southern Tree Breeding Association	38
Stahmann Farms Enterprises	23
Sugar Research and Development Corporation (SRDC)	140, DR236
Tasmanian Farmers and Graziers Association	89, DR227
Tasmanian Institute of Agricultural Research	3, DR213
Tasmanian Seafood Industry Council	54
Thomson, Dr Russell and Webster, Prof. Elizabeth	DR284
University of Adelaide	55, DR197
University of Melbourne	50
University of Queensland	DR186
University of Sydney	53, DR242
University of Tasmania	DR210
University of Western Australia	DR196
Vegetables WA	DR249
Victorian Catchment Management Council	131
Victorian Farmers Federation	65, DR177
Victorian Farmers Federation — Grains Group	64
Victorian Farmers Federation — Livestock Group	27
WA Grains Group	61
Western Australian Farmers Federation	88, DR251
Wellard Rural Exports	107
Western Australian Fishing Industry Council	141

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Table A.1 (continued)

Participant	*Submission number*
White, Barry	59
Winemakers Federation of Australia	21, DR192
WoolProducers Australia	48, DR214

Table A.2 **Visits**

Participant
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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Table A.2 (continued)

Participant
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
Gregson, Tony
Keniry, John
Melbourne School of Land and Environment
Primary Industries Climate Change Centre

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Table A.2 (continued)

Participant
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

Table A.3 **Public hearings**

Participant
Sydney, 4 and 5 November 2010
NSW Farmers Association
Across Agriculture
Australian Farm Institute
Fisheries RDC
Cotton Australia
Australian Mushroom Growers Association
Canberra, 8 and 9 November 2010
Commonwealth Fisheries Association
Triple Helix Consulting
Australian Centre for International Agricultural Research
New Rural Industries Australia
Angus, John
Sheepmeat Council of Australia
Winemakers Federation of Australia
National Farmers Federation
Melbourne, 12 November 2010
Australian Council of Deans of Agriculture
University of Melbourne
Apple and Pear Australia Limited
AUSVEG
Australian Fodder Industry Association
Australia Beef Association
Victorian Farmers Federation
Lawson, Don
Gene Ethics
Southern Farming Systems
Wallace, John
Ingram, Robert
Tamworth, 15 November 2010
Australian Agricultural Crop Technologies
NSW Farmers Association
Cotton RDC
Brisbane, 16 November 2010
Growcom
Canegrowers Australia and Australian Sugar Milling Council
Australian Cane Farmers
Conservation Farmers Inc
Peasley Horticultural Services
AgForce Queensland
D'Occhio, Michael

(Continued next page)

Table A.3 (continued)

Participant
Hobart, 22 November 2010
Tasmanian Seafood Industry Council
Tasmanian Institute of Agricultural Research
Tasmanian Farmers and Graziers Association
Australian Superfine Wool Growers' Association
Australian Wool Innovation
Australian Dairy Industry Council
TQA Australia
Adelaide, 24 November 2010
Seafood CRC
Australian Southern Bluefin Tuna Industry Association
Low Rainfall Collaboration Project
Council of Rural Research and Development Corporations
SA Grains Industry Trust and Australian Institute of Agricultural Science and Technology
Grape and Wine RDC
The University of Adelaide
McInnes, Peter
Keller, Michael
Perth, 25 November 2010
Pastoralists and Graziers Association of WA
Curtin University — Australian Sustainable Research Institute
Lindsay, David
Kondinin Group
Department of Agriculture and Food WA
WA Farmers Federation
WA Fishing Industry Council and National Seafood Industry Alliance
Liddelow, Janette
Network of Concerned Farmers
Mildura, 30 November 2010
Cattle Council
Citrus Australia
Meat and Livestock Australia and LiveCorp
Mallee Sustainable Farming
Birchip Cropping Group

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 of the returns from investment in rural R&D and notes important methodological issues and other complicating factors that may affect the precision of these results and, in turn, their application in a policy sense.

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, 2010) again found this range of returns to be representative for Australian investment in rural R&D.
- The Commission's own research has broadly aligned with the findings of Alston et al. (2000) and Mullen and Cox (1995).
  - PC (2007) 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.
  - Shanks and Zheng (2006), which helped underpin the analysis in PC (2007), calculated a 24 per cent return on investment in rural R&D.

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.[1] The evaluation further indicated that the benefits can materialise quickly, with 60 per cent of the sampled 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.[2] 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.
- In a study by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Sheng, Mullen and Zhao (2010) reported that a slow down in the rate of productivity growth in Australian broadacre agriculture since the mid-1990s can, in part, be attributed to reduced public investment in rural R&D (see below). A similar finding was made by Beddow, Pardey and Alston (2009) at a global level.
- Further ABARES research by Sheng, Gray and Mullen (2010) suggested that public investment in domestic rural research and extension activities has made approximately the same contribution to productivity growth in Australian broadacre agriculture as investment by other countries in their rural research (the results of which can often be adapted for applications in Australia).

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1 To derive an approximate rate of return, the benefit–cost ratio can by 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.

However, some caution is required with this simple calculation, which assumes perpetual annual returns from R&D. A more realistic pattern is that there will be low returns in early years, increasing to a peak level several years later, before declining again as the particular innovation is made obsolete. As such, rates of return that assume a perpetual benefit flow should be regarded as indicative only, and potentially overstated.

2 As per footnote 1, this implies a rate of return to ACIAR's work of 7 per cent.

B.2 General caveats and qualifications

As the Commission has previously outlined (PC 2007), a range of factors can influence the outcomes of econometric analysis (box B.1). These are pertinent in considering the studies outlined above, as well as other research in this field.

A key caveat is that comparing results across different studies can be problematic. 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.)

Box B.1 **Drawing conclusions from 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 what can be drawn from the results, especially with regard to policy setting.

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 complex relationship between R&D and productivity, which present challenges such as:
  - how to account for other factors that influence productivity growth, including R&D investment levels in other countries
  - the often long period of time before any benefits materialise from an initial investment in R&D
  - the best way to estimate or proxy marginal returns, which are most relevant in a policy context
- data imperfections, including:
  - the relatively limited availability of time series data (particularly in the context of lags between investment and the benefits from the research, noted above)
  - incomplete data on public R&D investment, and even less 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).

Nevertheless, the empirical evidence viewed in an overall sense is suggestive of good returns to investment in rural R&D.

Table B.1 **Rates of return by measure attributes**

Attribute	Number of estimates[a]	Rate of return					
		Mean	St. dev. (mean)	Mode	Median	Minimum	Maximum
	no.	%	percentage points	%	%	%	%
Real or nominal rate of return							
Nominal	351	70	64	52	51	-2	466
Real	1 302	77	146	46	44	-100	1 736
Nature of evaluation							
Ex ante	405	94	215	49	36	-12	1 736
Ex post	1 367	77	217	46	46	-100	5 645
Average or marginal rate of return							
Average	1 708	82	266	49	38	-100	5 645
Marginal	686	81	98	40	50	-1	1 219
Private or social rate of return							
Private	55	139	500	20	30	0	3 539
Social	1 717	79	201	40	44	-100	5 645
Rate of return reported or derived[b]							
Reported	1 683	72	200	46	44	-100	5 645
Derived	89	247	387	1	60	0	1 720

a Due to sample exclusions, the total number of estimates for each category will not always be equal. **b** 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).

In addition, the project-based nature of most of the empirical work may result in a systematic upward bias in reported returns. As noted in box B.1, this is because failed projects — and especially those that are terminated early — may not be encompassed by any *ex post* project-specific assessment, while highly successful 'hero' projects may be singled out for evaluation.

However, even using a portfolio assessment approach so that all project-related spending is included, reported returns are still significantly positive on average. Alston et al. (2000) found that aggregated assessments (by program or institution) indicated 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.[3]

[3] As per footnote 1, this implies a rate of return of 10 per cent. For context, project-specific assessments (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.

Sources of productivity growth

Productivity growth necessarily reflects a relationship between inputs and outputs. While the net effect — that is, multifactor productivity growth — is clearly important, it alone cannot tell the whole story. It is also useful to assess the impact of changes in labour and capital as well as in production. Input- and output-specific factors may provide explanations for overall productivity trends that would not otherwise be immediately apparent.[4]

More specific to this inquiry, the inherent complexity of productivity suggests that there are likely to be many different contributing and interrelated factors beyond solely R&D. Some particular issues are the extent to which observed rural productivity growth in Australia can be attributed to:

- R&D versus other factors (including climate variability and industry consolidation)
- domestic investment in Australian rural R&D versus investment in rural R&D that is both funded and conducted overseas
- research versus extension.

Section B.3 discusses recent work that has made substantial advances in this area. However, at a general level, the potentially high correlation between these factors will necessarily complicate efforts to estimate the specific contributions of each.

Furthermore, attempting to include every possible variable in an econometric analysis of productivity growth would most likely make the task intractable. To start with, it can sometimes be extremely difficult to identify appropriate data sources and/or usable proxy measures. The upshot of this is that caution is warranted about potentially significant causal factors being excluded from any analysis.

B.3 Recent studies by ABARES

Much of the past research into the role of rural R&D has only made passing reference to other factors, or simply assumed the shares of productivity growth that

4 For example, drought would be expected to reduce output in the rural sector and — holding inputs constant — therefore productivity. However, ABS data (ABS 2010c) reveal that capital services have also increased significantly across the agriculture, forestry and fishing industries since the 2002-03 drought. One plausible explanation for this could be that farms were investing in 'drought proofing' infrastructure, both as drought hit and in its aftermath. While such new expenditure would not likely deliver immediate output gains, thereby further reducing apparent productivity in the short term, benefits would be realised over time during future drought-affected periods.

could be attributed to different sources. However, the two aforementioned studies by ABARES have sought to attribute the sources of rural productivity growth in a more conceptually robust way.

- Sheng, Mullen and Zhao (2010) tested the significance of different variables — including investments in agricultural R&D, climate, farmer education and the terms of trade — in explaining productivity growth in Australia's cropping and livestock (broadacre) industries. Of all the variables considered, climate was estimated to have the largest effect on 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. By contrast, education and the terms of trade were estimated to have been considerably less important factors.
- Sheng, Gray and Mullen (2010) — which was released after the Commission's draft report — assessed the separate contributions of domestic and foreign R&D investment to productivity growth in Australia's rural sector. The study indicated that rural research and extension had contributed around 1.2 percentage points to a long-term (1953–2007) average productivity growth rate for Australian broadacre agriculture of 2 per cent, with that contribution further separable into:
  - 0.33 percentage points from domestic public R&D investments
  - 0.27 percentage points from domestic investment in rural extension
  - 0.63 percentage points from foreign R&D (the proxy for which was public R&D expenditure in the United States).

Taken together, these two studies have potentially significant policy implications. *Prima facie*, Sheng, Mullen and Zhao (2010) lends considerable support to the notion that increased investment in rural R&D could generate significant productivity benefits. In fact, the study was widely cited in this context by inquiry participants (for example, Australian Institute of Agricultural Science and Technology, sub. 12; Department of Industry and Investment — NSW, sub. 69; Meat and Livestock Australia, sub. 106; Across Agriculture, sub. 116; Growcom, sub. 122; Council of Rural Research and Development Corporations, subs. 128 and DR260; Grains RDC, sub. 129; Department of Agricultural, Fisheries and Forestry, sub. 156). Moreover, the follow-up study by Sheng, Gray and Mullen (2010) implies that the contribution of domestic R&D cannot be dismissed as insignificant relative to foreign R&D — notwithstanding the typically adaptive nature of much of Australia's rural research.

However, despite the advances in methodological techniques demonstrated in the ABARES studies, the Commission considers that there are still some critical issues associated with the econometrics that limit the weight that should be placed on the results when formulating policy. Essentially, there are three broad (and, in many regards, related) concerns.[5] These are:

- how much productivity growth is in fact attributable to public investments in domestic R&D versus private and overseas investment
- omitted non-R&D factors that may also be important in explaining rural productivity trends
- most significantly, uncertainties over the data that (among over things) raise doubts about whether recent productivity trends in broadacre agriculture are representative of what has occurred across the rural sector as a whole.

Attribution of R&D impacts

As observed in section B.2, specifying econometric models to accurately account for the various sources of productivity growth is challenging. Australian producers may realise benefits from R&D regardless of whether it has been privately or publicly financed, undertaken domestically or overseas, or indeed originally intended for rural applications or not.

Clearly, Sheng, Gray and Mullen (2010) has made significant progress in trying to disentangle at least one dimension of these effects — that is, in understanding the relative contributions of foreign and domestic R&D investments (box B.2). But as the authors themselves acknowledge, the attribution of foreign R&D impacts is far from settled (in large part due to data limitations, the general implications of which are discussed below).

The impact of private sector investment in R&D on Australian rural productivity has also been left largely unexplored by the recent ABARES' research. Public and private funding would seem to be largely interchangeable in examining the general

[5] In the draft report, the Commission raised some additional technical concerns about Sheng, Mullen and Zhao (2010), including that the productivity and funding datasets each covered a slightly different composition of industries; as well as the risk that, given how RDCs are funded, a productivity decline might induce a reduction in funding ('reverse causality'). Dr John Mullen (sub. DR172) disputed the Commission's assertion about data mismatching, while ABARES (sub. DR270) suggested that neither issue was of any real consequence in exploring rural productivity trends. The Commission accepts that any impacts of these factors would be small. As such, they are not pursued further in this final report.

Box B.2 **The effect of foreign R&D**

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, any correlation between domestic R&D funding and rural productivity growth would presumably apply to global R&D investment as well.

Until the work of Sheng, Gray and Mullen (2010), few attempts had been made to systematically account for the productivity impact of R&D undertaken in other countries.

For example, an analysis contained in Mullen (2010) — replicating Mullen (2007) — assumed that annual productivity growth consequent on Australian rural R&D would plausibly lie between 1.0 and 1.6 per cent (based on a long-term trend rate for productivity growth in broadacre agriculture of 2.0 per cent per annum). In one case modelled, it was assumed the entire 1.6 per cent benefit from R&D could be attributed to domestic research on the basis that 'some domestic research is required to capture the benefits from foreign spillovers' (p. 26). This is seemingly analogous to saying that extension is empirically responsible for the productivity gains from research since, without extension work, there would be little application of research outcomes.

Viewed in this light, the work of Sheng, Gray and Mullen (2010) represents a considerable advance. As discussed in the text, their study effectively separated explanatory variables for domestic and foreign R&D investment, allowing for more robust decomposition of the relative contributions of each.

Another relevant study (although focused on New Zealand's agricultural industry) was conducted by Hall and Scobie (2006). It found that where countries are substantially reliant on absorbing foreign R&D — as is the case for both Australia and New Zealand — then the more knowledge that is available overseas, the greater is the marginal return to domestic R&D.

However, disaggregating the relative impact of domestic and imported R&D — while conceptually important — is difficult in practice. Finding suitable proxies is one key challenge. Sheng, Mullen and Gray (2010) drew on US public expenditure data as a proxy for foreign R&D investment — thus excluding US private R&D spending, which could be a major source of adaptable innovations. Hall and Scobie (2006) relied on a measure of US patent registrations as their proxy, although not all rural R&D is subject to intellectual property protection.

More generally, Hall and Scobie (2006) emphasised that 'the estimates of the contribution of domestic R&D are very sensitive to the method and specification adopted, and … even with lengthy time series data, it is not easy to isolate the effect' (p. 33). Perhaps unsurprisingly, the more realistic a model is made in regards to simulating market conditions, the more complex the interpretation of results becomes. This is particularly the case where public and private, domestic and foreign R&D may all have broadly similar properties and be highly correlated.

Still, the conclusions of Sheng, Gray and Mullen (2010) with regard to the relative rural productivity impacts of domestic and foreign R&D investments seem intuitively reasonable, and are consistent with the common sense finding of Hall and Scobie (2006) that a domestic research capacity is necessary to absorb the benefits from foreign R&D.

linkage between productivity and investment in R&D.[6] Hence, even if public investment has fallen over recent years, conclusions drawn without taking into account what has been happening to private funding could be erroneous.

ABARES (sub. DR270, and reinforced in Sheng, Gray and Mullen 2010) suggested two reasons why the exclusion of a variable for private expenditure on rural R&D may not have a meaningful impact on any assessments of the sources of productivity growth in the Australian rural sector:

- Private expenditure on rural R&D in Australia has historically been small relative to public sector spending.
- Much of the private R&D that does occur goes into commercial applications, developed off farm, that are used as inputs on farm, which in turn are already captured in the productivity data.[7]

However, it is unclear to the Commission that the potential significance of private expenditure as an explanatory variable can be quite so easily dismissed. In particular, any private investments in *on-farm* R&D (that is, producers undertaking their own R&D — either individually or through cooperatives such as the Birchip Cropping Group — rather than drawing on the public system or buying innovations 'off the shelf') would not constitute an input for the productivity measures in question. There are insufficient data (see below) to clearly identify the relative balance between private investments in on-farm and off-farm R&D, nor whether this balance has shifted over time. Nonetheless, were private spending on rural R&D (not encompassed in farm-purchased inputs) to have increased at a rate sufficient to offset the decline in public spending, this would clearly be pertinent to any analysis of productivity trends.

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6 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, the Commission cannot see why it should matter greatly whether the funding comes from public or private sources. Moreover, were there to be any significant difference in this regard, then 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.

7 Examples of private R&D on input-related commercial applications would include such areas as satellite-based precision agriculture technologies and biotechnological improvements in crop varieties. To the extent that royalties and other payments from (on-farm) producers allow (off-farm) private investors to capture the benefits of their R&D, then these are already reflected in the productivity data (which are calculated on the basis of the difference between the value of inputs and outputs). Put another way, such off-farm appropriation of benefits would mean that 'the productivity effect of an increase in output would be at least partially offset by the measured increase in higher quality inputs' (Sheng, Gray and Mullen 2010, p. 6).

Other omitted variables

Rural productivity growth may also be affected by a range of non-research-related factors. For example, and as noted above, Sheng, Mullen and Zhao (2010) tested for the impact of climate variability, the terms of trade and farmers' education.

However, one factor that was absent from this analysis was the role of industry rationalisation. The rise of larger farming enterprises, and the concomitant departure of weaker operators, have likely had a strong positive impact on the sector's productivity — in turn potentially impacting on adoption of new technologies and other on-farm innovations.

In responding to the draft report, ABARES (sub. DR270) disputed the relevance of industry rationalisation in the context of analysis designed to identify the contribution of R&D to observed productivity growth.[8] Specifically, it contended that such consolidation would be uncorrelated with public investment in rural R&D and that, accordingly, the omission of a consolidation variable would not affect the estimated impact of rural R&D on productivity.

While the Commission accepts the substance of this argument, it does not consider that the effect of consolidation can be entirely ruled out in an econometric sense. As AgForce observed, 'farm consolidation is enabled by improvements in both production techniques and communication technologies that result in greater labour efficiency and capacity' (sub. DR238, pp. 5–6). As a practical example of this, Nossal et al. (2009) noted the productivity impact of consolidation in the dairy industry since 2000. In that industry, larger (and ultimately more efficient) dairy operations replaced small unprofitable farms, increasing farming intensity and technological adoption. As such, if the extent of rationalisation has slowed over time,[9] this could reduce the marginal return from R&D spending — in turn meaning that if a consolidation variable is not included, any impact of a downturn in R&D spending could be overstated.

Data-related uncertainties

The most substantive concern — both in its own right, and because it underpins the

8 ABARES (sub. DR270) further argued that the omission of any relevant variables would have no bearing on the 'structural-break analysis' contained in Sheng, Mullen and Zhao (2010). However, as discussed below, the Commission's concern in this area relates more to data uncertainties than model specification.

9 Previous Commission research has suggested that after growing by 1 per cent each year during the early 1980s, average farm size then grew at only 0.5 per cent a year in the subsequent period through to 2002-03 (PC 2005).

concerns discussed above — relates to the availability and interpretation of data on productivity trends and rural R&D funding levels. Specifically:

- there is significant uncertainty about whether productivity trends in broadacre agriculture have been representative of those for the entire rural sector
- there are insufficient data to establish precisely what has been happening to total funding for rural R&D.

Trends in productivity growth

Sheng, Mullen and Zhao (2010) — as well as other research in this area — has preferred to use ABARES' farm survey data for broadacre industries. This dataset demonstrates a trend decline in productivity for broadacre agriculture since the mid-1990s. Yet this headline finding masks significant variation across individual rural industries. Nossal et al. (2009) noted that 'the slowdown [in broadacre productivity] has been largely restricted to cropping industries' (p. 213). Hence, while 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.

This divergence in results within the broadacre industries in turn raises the question of whether the aggregate broadacre agriculture trends can be taken as representative of the rural sector as a whole. Importantly, Australian Bureau of Statistics' data for all agriculture, forestry and fishing (ABS 2010c) appear to show a different story from that reflected in the broadacre-specific analysis. As separate Commission research (PC 2010a) has established, owing to drought, average multifactor productivity growth in the agriculture, forestry and fishing sector was -1.2 per cent between 2003-04 and 2007-08.

- But as climatic conditions improved in 2008-09, multifactor productivity rose by 14 per cent. While it is generally problematic to draw conclusions from a single year change, this particular rise was consistent with the patterns of drought in previous productivity cycles: depressed growth during periods of low rainfall followed by a pronounced 'bounce' thereafter.[10]
- 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, forestry and fishing averaged between 3 and 4 per cent.

[10] That the 2008-09 recovery was not included in the most recent complete productivity cycle is arguably due to the definition of those cycles across the entire market economy, rather than specific to conditions in the agriculture, forestry and fishing sector.

Also, when compared to other parts of the economy, trend productivity growth for the rural sector has been relatively stable. Indeed, although there has been an apparent slight decline in productivity growth since the mid-1990s, this is not statistically significant at any reasonable level of certainty (box B.3).

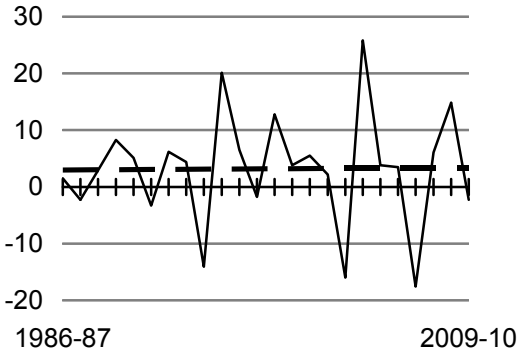
Box B.3 **Trends in multifactor productivity growth for agriculture, forestry and fishing**

To test the widely held view that trend productivity growth has declined in the rural sector, the Commission examined the ABS data for agriculture, forestry and fishing dating back to the mid-1980s. While a simple linear regression for the period since 1993-94 suggests a small apparent decline in productivity growth, the full data series (going back to 1986-87) in fact indicates a very slight increase. Importantly, neither of these results are statistically significant — in turn implying that there is little evidence of a change in trend productivity growth (up or down) across the entire rural sector over the last quarter of a century. If anything, despite obvious year-to-year volatility, *trend* productivity growth for all agriculture, forestry and fishing appears to have been remarkably stable over this lengthy period.

1986-87 to 2009-10

Average growth rate	2.68%
Slope	0.017
	(0.303)
Intercept	2.945
	(4.327)
R^2	0.000

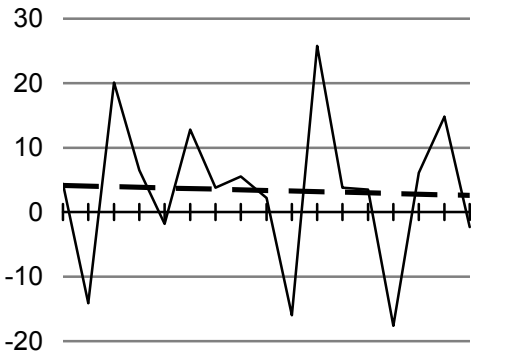
Standard errors in parentheses. Slope and intercept coefficients **not** statistically significant at the 10 per cent confidence level.

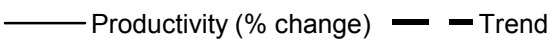


1993-94 to 2009-10

Average growth rate	2.74%
Slope	-0.096
	(0.600)
Intercept	4.245
	(6.147)
R^2	0.002

Standard errors in parentheses. Slope and intercept coefficients **not** statistically significant at the 10 per cent confidence level.





Source: Original series from ABS (*Experimental Estimates of Industry Multifactor Productivity, Australia: Detailed Productivity Estimates, 2009-10,* Cat. no. 5260.0.55.002).

Further, while the ABS dataset does not extend as far back in time as the broadacre estimates provided by ABARES, it is notable that data for the entire rural sector do not replicate the sharp divergence in annual productivity growth before and after 1993-94 — the structural break identified by Sheng, Mullen and Zhao (2010).

- Sheng, Mullen and Zhao (2010) reported that annual broadacre productivity growth averaged 2.2 per cent between 1953 and 1994, but only 0.4 per cent between 1994 and 2007.
- ABS data indicate that between 1987 and 1994, productivity growth in all agriculture, forestry and fishing industries averaged 2.6 per cent. However, between 1994 and 2010, productivity growth across the sector averaged 2.7 per cent. (And even for the 1994–2007 period covered by the ABARES study, sector-wide productivity growth averaged 2.1 per cent a year — substantially higher than the estimated average for broadacre industries.)[11]

In responding to similar observations in the draft report, ABARES argued that the richness of the broadacre data allowed for the use of 'sophisticated statistical techniques designed to address the various methodological issues [discussed above]' (sub. DR270, p. 12). But it did not challenge the notion that, just as there has been variation within broadacre industries, it is probable that there will be variation in productivity trends between broadacre industries and other parts of the rural sector.

Indeed, it is almost inevitable that productivity growth in individual rural industries or sub-sectors will be more volatile than for the rural sector as a whole. Not only will factors such as weather affect parts of the sector differently, but the research opportunities available in particular industries will vary over time, leading to bursts of high productivity growth followed by more subdued performance until the next 'breakthrough' innovation. This reinforces the need for considerable caution in drawing conclusions from analyses of sub-sector productivity outcomes.

In summary, the Commission finds that the available evidence is inconclusive about whether trend productivity growth across the entirety of the rural sector has actually slowed to any great extent. Further, the observed productivity growth in broadacre industries does not appear to the Commission to be a good basis on which to draw conclusions about sector-wide trends.

Funding levels for rural R&D

Although it is commonly perceived that public investment in rural R&D has been declining, the aggregate funding data are deficient in various respects (chapter 2).

[11] Average productivity growth rates are calculated on a geometric (rather than arithmetic) basis.

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 (particularly given the multitude of spending programs relevant, but not specific, to the agricultural sector — for example, investments in climate change mitigation). Therefore, it is difficult to conclude categorically that total public funding has fallen significantly over time.

Furthermore, the available data on private investment are even weaker than for public funding. The limited indications that exist suggest that private investment is unlikely to have increased significantly (at least since the 1990s — see chapter 2). Even so, as discussed earlier, the exclusion of private investment from the ABARES studies is another reason for caution in the strength of the conclusions that are drawn from that work.

B.4 The bottom line

There remain considerable empirical uncertainties in relation to the link between R&D investment and productivity growth in Australia's rural sector. Nonetheless, the empirical work collectively 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 also recognises that recent work by ABARES is more sophisticated than much of the research that has preceded it. Sheng, Mullen and Zhao (2010) and Sheng, Gray and Mullen (2010) have both explicitly sought to address some of the limitations that have detracted from previous studies.

That said, in the Commission's view, the ABARES studies do not provide a basis for determining how much Australia should in future be investing in rural R&D, where that investment should occur, or what share of it should be publicly funded. Even were the historic productivity analyses and correlations to be without question, the policy settings underpinning those outcomes would not necessarily be appropriate in the future. As such, even the best econometric studies of past research benefits are no substitute for robust analysis of how individual government funding programs should be configured to deliver the best value from future public investment. The Commission's findings on these matters are set out in chapter 4.

C Current assistance levels

This appendix elaborates on the discussion in chapter 6 on the basis for the Commission's estimates of the assistance afforded to industry-focused research within the RDC model relative to that provided to comparable research in other sectors via the R&D tax incentives. It also provides a more comprehensive discussion of participants' critiques of those estimates and the Commission's responses to them.

C.1 What are assistance measures intended to indicate?

For many years, the Productivity Commission and its predecessors have provided estimates of the assistance provided to Australian industries by tariffs; other restrictions on imported goods; and various budgetary support measures, including for R&D. These estimates involve the application of a conceptual framework that allows for the comparison of sometimes disparate forms of assistance across industries and sectors.

The key notion underlying this measurement framework is that government assistance, whatever its particular form, is intended to attract resources to an activity that would otherwise be used elsewhere. In essence, the Commission's assessment measurement framework provides an indicator of the comparative strength of these 'resource-pull' effects, and thus the changes in the incentives to engage in particular economic activities consequent upon the provision of government assistance.

In reporting assistance levels, including from support for R&D, the Commission typically expresses the value of assistance in a way that tries to capture by how much assistance has increased returns per unit of activity, relative to the no-assistance scenario. This is in accordance with usual assistance measurement conventions.

As the alternative assistance estimates submitted by inquiry participants illustrate, other benchmarks can be used. A number of those alternative estimates have been useful in highlighting how the simplifying assumptions necessary for any summary assistance measure can alter the measurement outcome. However, as the subsequent

discussion illustrates, the methodologies employed to deliver a much smaller assistance disparity than suggested by the Commission's estimates are demonstrably inappropriate in this particular measurement context.

Assistance estimates must be interpreted carefully

In the body of the report, the Commission has emphasised that because of the limitations of the studies that attempt to quantify the impacts of past R&D spending on the rural sector's productivity, the outcomes of those studies must be carefully interpreted. The same is also true of summary assistance measures of comparative R&D support, irrespective of precisely how they are calculated.

First, the magnitude of the assistance-induced change in per unit returns is used as an indicator of the resource-pull/incentive effect. But in reality, this effect will depend on the demand and supply responses to that change in per unit returns. For a variety of reasons (see chapter 5), the Commission has concluded that the very substantial government assistance provided through the RDC program has not induced a particularly significant amount of additional research. Hence, in this particular case, the main concerns relate to the efficiency costs of raising revenue to fund research that primary producers would often have had sound financial reasons to fully fund themselves; and to the opportunity costs of that funding.[1] Conversely, the more usual concern — namely, that if assistance exceeds the level necessary to overcome any market failures it may induce investment in a significant amount of activity that is not of net benefit to the community once the costs of assistance are taken into account — is of less relevance.

Second, where industry contributions to the RDCs exceed the matching contribution cap, for these above-cap investment dollars, no assistance is provided. As elaborated on in section C.4, this in turn means that there can be a large difference between the average and marginal level of assistance that is provided through the RDC arrangements. In contrast, under the generally available R&D tax incentives, average and marginal assistance are always in lock-step. The upshot is that for above-cap industry contributions, the assistance disparity with the R&D tax incentives detailed below runs the other way.

1 As discussed in chapter 6, the same may also be true for the basic 125 per cent tax incentive.

C.2 The Commission's estimates

Comparative average assistance levels

The principal means by which the Australian Government assists R&D outside the rural sector is through tax incentives (Australian Government 2010; DIISR 2010).[2] While the Government has proposed changes to these incentives (see below), they currently comprise a:

- 'basic' tax deduction of 125 per cent for eligible R&D expenditure
- 'premium' tax deduction of 175 per cent for eligible expenditure on labour and for that part of a company's claim above its average annual R&D spending in the previous 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.

At a 30 per cent company tax rate, the basic (125 per cent) tax concession equates to a subsidy of 7.5 per cent, while for the premium tax concession (175 per cent), the effective subsidy is worth 22.5 per cent. Rebasing the former in a way which allows best comparison with the matching contribution regime for the RDCs, a firm accessing the basic tax concession that spent $108 on eligible R&D, would, *by virtue of the concession alone*, see the cost of its investment reduced to $100 — a benefit of $8. (Or put another way, by virtue of the R&D tax incentive alone, the Government would 'add' $8 to the value of a $100 R&D investment made by a company.) For the premium tax concession, the equivalent cost saving would be $29.[3] For the reasons discussed below, these benefit figures do not take into account the standard tax deduction that the R&D investment, like other business expenses, would attract.

In comparison, matching government contributions to the industry RDCs averaged $83 per $100 of industry contributions over the period 2000-01 to 2008-09 (table C.1). In other words, measured on this basis, the average rate of government contribution to the RDCs was 10.2 and 2.9 times the specific support available to non-rural industries through the basic and premium R&D tax incentives, respectively.

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2 Tax incentives are expected to account for around three-quarters ($1.6 billion) 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).

3 Formally, these benefits are respectively derived as ($100/{1-0.075} minus $100), or $8.11; and ($100/{1-0.225} minus $100), or $29.03.

Table C.1 **Australian Government contributions to the RDCs per $100 of industry contributions, 2000-01 to 2008-09[a]**

RDC-type	*2000 -01*	*2001 -02*	*2002 -03*	*2003 -04*	*2004 -05*	*2005 -06*	*2006 -07*	*2007 -08*	*2008 -09*	*Average*
	$	$	$	$	$	$	$	$	$	$
Statutory RDCs[b,c,d]	92	87	87	95	77	85	88	77	71	84
Industry-owned corporations[c]	73	79	74	82	81	78	82	90	96	82
All RDCs[c,d]	**82**	**83**	**79**	**87**	**79**	**81**	**84**	**84**	**84**	**83**

[a] Excludes contributions for marketing, promotion and industry representation. Industry contributions are the amounts received by RDCs after the Australian Government deducts its fee to cover the costs of collecting industry levies. These collection costs averaged less than 1 per cent of levy receipts in 2008-09 (chapter 10). [b] Excludes government funding for the recently abolished Land and Water Australia, for non-industry-specific R&D sponsored by the Rural Industries RDC, and for broader resource management research undertaken by the Fisheries RDC (FRDC). [c] These contribution rates are a weighted average across individual RDCs, with the weight used being each RDC's share of combined government and industry contributions for the relevant group of RDCs in that year. [d] The contribution rates for the statutory RDCs, and hence for all RDCs, have been revised down somewhat since the draft report to net out some previously included government funding for broader resource management research sponsored by the FRDC. By way of comparison, the figure for the average government contribution for all RDCs over the period 2000-01 to 2008-09 in the draft report was $91.

Source: 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.

Under the proposed changes to those tax incentives (see Treasury 2010), government support for eligible R&D would become equivalent to a tax deduction of 133⅓ per cent for entities with a turnover of $20 million and above, and 150 per cent for smaller entities.[4] This would in turn equate to a dollar subsidy calculated on the same basis as above of $11 and $18, respectively[5] — again, very much lower than the average level of support ($83) provided over the last decade by the matching government contribution arrangements for the RDCs (table 6.1).

The above comparisons were summarised in table 6.1 of the report, which is reproduced below as table C.2, to provide a reference point for the subsequent discussion of the alternative assistance measures put forward by participants.

4 These new tax incentives would in fact take the form of a non-refundable tax offset of 40 per cent and a refundable tax offset of 45 per cent, respectively — or 33⅓ per cent and 50 per cent greater than the standard tax deduction of 30 per cent. Where the amount of tax owed was less than a non-refundable offset, the unused portion could be carried forward and set against a future tax liability. In contrast, the Government would pay a cash refund for the unused portion of a refundable tax offset.

5 As indicated in footnote 4, at a 30 per cent company tax rate, the R&D-specific benefits of the offsets would be equivalent to additional deductions of 10 per cent and 15 per cent, respectively. In turn, and using the methodology described in footnote 3, the relevant dollar benefits are respectively calculated as ($100/{1-0.1} minus $100), or $11.11; and ($100/{1-0.15} minus $100), or $17.65.

Table C.2 **Comparative assistance levels**

	Government contribution per $100 of industry contribution[a]	*RDC contribution relative to tax incentive*
	$	multiple
Current R&D tax concessions		
Basic (125%)	8.11	10.2
Premium (175%)	29.03	2.9
Proposed R&D tax offsets		
Turnover ≥ $20m (133⅓%)	11.11	7.5
Turnover < $20m (150%)	17.65	4.7
Matching contributions to RDCs[b]	83	

[a] For the tax concessions and offsets, this contribution is equivalent to the reduction in the cost to a firm of an eligible investment in R&D that results from the specific tax incentive; calibrated such that the cost to the firm net of this benefit, but before making any allowance for the standard tax deduction (assumed to be 30 per cent), would be $100. For example, at the 30 per cent company tax rate, the specific benefit from the basic tax concession is equivalent to 7.5 per cent, meaning that for a gross R&D expenditure of $108.11 (100/{1-0.075}), the cost to the firm before making any allowance for the standard tax deduction would be $100. [b] Based on overall government and industry contributions to the RDCs over the period 2000-01 to 2008-09, as revised down since the draft report (see table C.1).

Source: Productivity Commission estimates.

C.3 Alternative estimates

In submissions both prior to, and in response to, the draft report, many participants contended that the measures above significantly overstate the extent of the disparity in assistance between the RDC arrangements and the tax incentives. A number provided alternative assistance measures suggestive of a lower disparity (including, ABARES, sub. DR270; Across Agriculture, subs. 116, 163; the BDA Group, sub. DR165; and Dairy Australia, subs. 130 and DR265).

The key strands to the critiques and the Commission's responses

The assistance denominator

One reason for the lower measured assistance disparity in some of the alternative estimates was the 'output value' base used to calibrate the rate of assistance. Specifically, in one way or another, the value of the assistance was effectively included in both the numerator and denominator. For example, the BDA Group (sub. DR165, p. 3), calculated the value of the matching contribution for the RDCs

as \$91/\$191,[6] and then compared this percentage with the 7.5 per cent tax concession to get an assistance ratio of 6.4. As noted above, in line with the most commonly employed assistance measurement convention, the Commission's measures are calibrated against the industry contribution *exclusive* of the specific R&D support, and therefore remove the value of assistance from the denominator.

Where the assistance provided is low — as in the case of the basic R&D tax incentive — this difference in approach matters little. This is because the denominator is changed by a relatively small amount. But as the value of the assistance increases, the choice of output base has an increasingly bigger effect on the measurement outcome. Hence, while in the calculation performed by the BDA, the value of the tax incentive changes only slightly (to 8.11/108.11 from 8.11/100), the apparent value of the matching contributions is nearly halved (to 91/191 from 91/100).

There is no fundamental assistance measurement law that says that government support cannot be calibrated in this way — it does not change the relativities in the per unit dollar amounts of support involved. However, the approach obviously makes it easier to 'conceal' large differences in the value of support. Using the same sort of calibration methodology in a tariff environment, for example, would see a tariff of 100 per cent providing 'only' 5.5 times as much support as a tariff of 10 per cent ({(1/2)/(0.1/1.1)}). To most people, this would be a highly counterintuitive way of viewing the relativities in support.

Total cost to government arguments

By far the most significant way through which the alternative assistance estimates achieved a reduction in the apparent assistance disparity was through the use of a 'total cost to government' approach. In essence, this involved adding the standard tax deduction available for any business expense to the assistance provided by the R&D tax incentives and the matching contribution, respectively.

From a purely computational perspective, the combination of the standard tax deduction for business expenses with the specific R&D support measures in question necessarily serves to reduce the measured assistance disparity. Adding the value of the company tax rate (30 cents in the dollar) to the 'incremental' value of the 125 per cent R&D tax incentive (7.5 cents in the dollar), increases the Government's total contribution five-fold. Conversely, adding the same 30 cents in the dollar to the average matching contribution under the RDC arrangements

[6] As noted in table C.1, the Commission has revised down the average government contribution per \$100 of industry contribution from the \$91 indicated in the draft report to \$83.

increases the total cost of government support by only around 35 per cent (30/83). The consequence is that the apparent disparity in support between the RDC arrangements and the 125 per cent tax incentive falls from 10.2 times (see table C.2) to less than 3 times.[7]

This disparity is somewhat larger than the 'equivalent' disparities reported by both ABARES (sub. DR270, pp. 3–5) and Dairy Australia (sub. DR265, pp. 6–7) using their particular total cost to government measurement methodologies. Based on the average matching contribution of $91 per $100 of industry contribution figure used in the draft report, their estimates were 1.7 and 2.2, respectively.

However, such relatively minor differences are largely immaterial given that, in the Commission's view, the total cost to government approach is evidently inappropriate in this particular measurement context. As alluded to above, for the purposes of the policy issues at hand in this inquiry, assistance comparisons should provide an indicator of the comparative strength of the resource-pull/incentive effects from the specific measures designed to encourage more investment in R&D. The standard tax deductions — which those using the total cost to government approach have bundled into their calculations — would still be available even were there no specific tax or other incentives for R&D.[8] This in turn explains why the approach can lead to some seemingly implausible measurement outcomes. In particular, were there to be *no* R&D tax incentives, this approach would report assistance from the matching contribution as less than four times as generous as from the non-existent tax incentive.[9]

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7 Formally, and in keeping with the methodology used to compile the estimates in table C.2, the total value of the tax incentive (inclusive of the basic tax deduction) would be $40.54 ($108.11x{0.3+0.075}); while the Government's total contribution through the RDC arrangements would be $113 ($83 matching contribution for the $100 industry contribution, plus a tax deduction of $30 on that industry contribution). Hence the assistance disparity would be 2.79 times.

8 Where the tax incentive is paid as a refundable offset to a company which has insufficient taxable income to fully defray the value of the incentive, the separability of the standard tax deduction and the R&D-specific tax benefit is less clear cut. However, absent a refundable offset for expenditure on R&D, any forgone benefit from the standard tax deduction could be carried forward (as a tax loss asset) and set against future taxable income. While tax loss assets are not indexed, unless a company did not earn taxable income for an extended period, this feature of the refundable offset would not affect the substance of the argument in the text.

9 As per footnote 7, the value of the numerator indicating the share of the total cost of investments made by the RDCs that is met by the Government would remain unchanged at $113. The value of the denominator would, however, fall to $30 ($100 times the company tax rate of 30 cents in the dollar). Hence the measured disparity in assistance in this 'no tax incentive' scenario would be equal to 3.77 times. (Employing the methodology used by Dairy Australia (sub. DR265, pp. 6–7), the disparity would be even smaller at just 2.09 times.)

A number of the total cost to government analyses took this approach even further, suggesting that primary producers would often be unable to claim a 30 cents in the dollar deduction for business expenses. For instance, ABARES (sub. DR270, pp. 3–5), reported calculations showing that if primary producers' average marginal tax rate was 10 per cent, then the current RDC arrangements would be less generous than the current premium tax concession. Similar calculations were provided by Dairy Australia (sub. DR265, p. 6) and replicated by the CRRDC (sub. DR260, p. 46).

Ready made data on average tax rates for primary producers are not available — in part because of the variety of tax structures that are evident in the sector. Even so, as set out in box C.1, there is some evidence to suggest that this average rate may not be greatly different from the average company tax rate. Hence, even within the confines of this inappropriate measurement approach, a presumption that primary producers have significantly less capacity than companies to access standard tax deductions for R&D and other business expenses is probably unwarranted.

But again, the Commission's main concern relates to the implications of embellishing an already inappropriate measurement methodology in this way. In effect, the argument is being put that the matching contribution needs to be more generous than the R&D tax incentives to compensate for the fact that primary producers have generally low incomes and therefore get less value out of the basic tax deduction for business expenses than do companies. A logical extension of this argument would be that the Government should introduce matching contribution arrangements for all types of business expenses incurred by primary producers, or any other non-taxpaying entity.

The Commission further observes that the prospects of an entire sector that did not generate any taxable income over a long period would be open to question. In these circumstances, it would be unlikely that continuing to provide significant support for that sector's R&D would be a good use of the public funds involved.

'Diversion' of government contributions to the RDCs

Several participants observed that the value for levy payers of the Government's matching contribution to the RDCs is diluted by the diversion of some of that contribution into non-industry specific research, and by what were perceived to be comparatively onerous reporting requirements.

Box C.1 **Comparative average tax rates**

As noted in the text, ready-made data on the average tax rates paid by primary producers are not available. This is partly because primary producers operate under a variety of tax structures, including corporate, partnership, trust and sole trader. A further complicating factor is that some of the data that is available combines farm income with other sources of income.

Nonetheless, those data that are available — together with general company tax data — do call into question the presumption in some of the total cost to government assistance measures submitted by participants that primary producers have considerably less scope than firms elsewhere to access the standard tax deduction for business expenses.

- It is not only primary producers who can suffer from periods of poor profitability. Indeed, as the refundable offset provisions in both the current and proposed tax incentive regimes recognise, even companies with good longer term prospects may not earn profits during their start up phase. Partly for this reason, the average rate of tax paid by companies is less than the 30 cent maximum rate. The Commission used ATO (2010) data to estimate some 'average effective tax rates' — defined as net tax paid divided by taxable income — that are germane in this context. These indicated that over the five-year period 2003-04 to 2007-08:
  - the average effective tax rate for corporate agricultural entities of 26 cents in the dollar was fractionally higher than the average rate for non-rural corporate entities of 25 cents in the dollar
  - for individual farm entities, the average rate was a little higher again — 28 cents in the dollar — though this rate encompassed both farm and non-farm income.

  The Commission further notes that this five-year period was a very challenging one for many primary producers.
- ABARES (2010) farm survey data indicate that, over the decade to 2008-09, across broadacre establishments with an estimated annual value of agricultural operations above $40 000 (in the last year covered by the survey):
  - in no years was average farm cash income negative
  - in only one of the ten years was a rough proxy for taxable income — (farm cash income + build up in trading stocks – depreciation) — negative. (Importantly, the farm cash income measure is net of 'cash' costs including interest payments.)
  - this proxy measure averaged a little over $40 000 a year over the decade. For a non-corporate entity, this would translate to a marginal tax rate of 30 cents in the dollar — the same as the maximum company tax rate.

  The establishments targeted through the survey are estimated to contribute more than 98 per cent of the value of total broadacre output.

While these arguments have conceptual validity, as the commissioning of this inquiry partly reflects, across the RDC program as a whole, the 'leakage' of

government funding into broader research appears to have been relatively minor. Accordingly, such leakage could not possibly be a basis for arguing that the matching contribution regime only provides comparable assistance to the tax incentives. Similarly, although the Commission's estimates do not take into account the potentially higher administrative and compliance costs of the regime, equally, they do not make allowance for other factors that would tend to increase rather than reduce the disparity in assistance.

- As noted by DAFF (sub. 156, pp. 40–1), the definitions of eligible R&D for the purposes of the tax incentives are more stringent than those for expenditures which qualify for the matching government contribution. (Also, the costs of making and substantiating R&D tax incentive claims are not trivial either.)
- As outlined in PC 2007 (pp. 399–400), the operation of Australia's dividend imputation system has the potential to clawback some of the benefits of the tax incentives.

Value added assistance metrics

In the draft report, the Commission presented some further assistance comparisons that related the level of government support to value added. Specifically it reported that in 2008-09:

- government outlays on the R&D tax incentives for non-rural industries were equivalent to around 0.13 per cent of the collective value added of those industries
- the corresponding figure for the matching government contributions to the RDCs as a proportion of value added in the agriculture, forestry and fishing industries was 0.74 per cent — or some six times greater
- a similar calculation based on the proposed new tax incentives would produce a ratio of between four and six times depending on the turnover of claimants.

In its response to the draft report, Dairy Australia (sub. DR265, p. 8) pointed out that some of the government contribution for the RDCs is used to match levies paid by processors. It went on to argue that if the comparison of support is to be made using value added in the rural and non-rural sectors as the respective denominators, the processor-related component of the current government contribution should be excluded from the rural side of the equation. Based on its particular circumstances, Dairy Australia estimated that making this adjustment could see the value of the matching contribution as a percentage of value added in the rural sector fall to below 0.5. It also contended that the Commission's 0.13 per cent estimate for the non-rural sector was heavily influenced by the limited use of the tax incentive in the tertiary sector. Using data from PC 2009, it calculated that for both the

manufacturing and mining sectors, in 2008-09, the ratio of support through the tax incentives as a percentage of sectoral value added was around 0.4 per cent — little different from its adjusted figure for the rural sector.

In the Commission's view, these are legitimate observations.

However, their relevance lies in highlighting the problem with the precise nature of the value-added comparison put forward in the draft report, rather than in calling into question the Commission's broad conclusion on assistance disparities.

Specifically, as indicators of the likely strength of the resource-pull/incentive effects of government support, assistance measures are generally rate (per unit) based. In contrast, the value added assistance measure in the draft report conflated per unit and quantity effects. That is, the total value of assistance in the numerator of this measure represented the product of the rate of assistance and the output base to which it was applied. Similarly, the value added denominator in these calculations was quantity based.

In these circumstances, quantitative differences across sectors — which are not relevant when looking at disparities in per unit levels of support — become potentially very important in interpreting the results of the comparisons. A particular issue in this context relates to differences in the level of private spending on R&D as a percentage of sectoral gross value added (referred to hereafter as 'private research intensity').

- The total value of the R&D tax incentives paid to the mining and manufacturing sectors in 2008-09 (PC 2010b, tables A.5 and A.6), imply total research expenditures of around $3 billion and $4 billion for these two sectors, respectively. As a percentage of sectoral value added (ABS 2010a), these expenditures in turn represent a little under 3 per cent and around 4 per cent, respectively.
- In contrast, the industry contributions paid to the RDCs in 2008-09 (see table 2.3) represented only around 0.8 per cent of sectoral value added (after deducting the 20 per cent processor component suggested by Dairy Australia.)

If in a proportionate sense one sector is investing several times more heavily than another in research, but the total dollar value of the assistance it receives as a portion of its output or value added is the same, then it follows that the per unit rate of assistance it is receiving must be lower. Given that 'private research intensity' in the mining and manufacturing sectors appears to be several times greater than in the rural sector, then even if the total assistance to value added ratios were broadly the same for all three sectors (essentially the Dairy Australia contention), then the

implication would still be that per unit rates of support for the rural sector are several times higher than in the other two sectors.[10]

Thus, the legitimate criticisms of the particular value added-related measure presented in the draft report do not in fact undermine the general conclusion that the average assistance provided by the matching contribution arrangements has been several times greater than the support provided to other sectors through the R&D tax incentives. That said, as the preceding discussion illustrates, the use of such value added measures has the potential to confuse rather shine light on assistance relativities — which is why the Commission has removed them from its assistance analysis in the body of the report.

C.4 The matching contribution knife-edge

While the Commission sees its assistance estimates as usefully highlighting the overall generosity of the matching contribution arrangements, as indicated at the outset of this appendix, they are nonetheless summary indicators that must be interpreted carefully. The particular issue here is that once the cap on the matching contribution is reached, there is no government support for any additional levy or other industry contributions.

As alluded to earlier, this means that there can be a large difference between the average level of assistance provided under the matching contribution regime, and the level of assistance provided on the marginal dollar of industry contributions to the RDCs.

- Where revenue from industry contributions is less than the cap, the marginal and average levels of assistance are the same (dollar for dollar).
- But where industry contributions exceed the cap, the marginal level of assistance falls to zero and the average level of assistance for the industry concerned declines below one for one. In industries such as grains and wool, above-cap industry contributions have been significant. This is in turn why average

[10] As a simple stylised illustration, suppose that in sector A private research intensity (as denoted in the text) is 0.05, the sector's value added is $100 and the assistance it receives from the Government for its research spending as a proportion of that value added is equal to 0.02. Suppose also that in sector B both value added and government assistance as a proportion of that value added are identical to sector A, but that private research intensity is just 0.01. In these circumstances, both sectors would receive $2 of assistance. However, as a portion of the value of research undertaken this would represent 40 per cent in sector A compared to 200 per cent in sector B — with this disparity being identical, but in reverse, to the sectoral difference in private research intensities.

assistance across the whole of the RDC program over the last decade has been a little less than one for one.

In most, if not all, situations it is assistance at the margin that matters most for decision-making. Hence, the Commission sees the knife-edge in the current matching contribution arrangements as being a significant problem. Its suggested remedy is described in chapter 7 of the report.

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