Australian Government
Department of Agriculture, Fisheries and Forestry

Mr Bill Henderson
Science and Innovation Study
Productivity Commission
PO Box 80
BELCONNEN ACT 2616

Dear Mr Henderson

Thank you for the opportunity to provide comments on the Draft Research Report "Public Support for Science and Innovation".

We have found the report comprehensive and generally we support its findings. We do, however, wish to take issue with the preliminary finding that there is only a weak rationale for the present level of public co-funding of some industry-centred Rural Research and Development Corporations (RRDCs).

The Commission has concluded that strong public support for RRDCs with a public-good orientation is justified but that the level of government subsidies for some more industry-focussed arrangements may crowd out private activity and produce only weak external benefits.

The Australian Bureau of Agricultural and Resource Economics (ABARE) has reviewed the Draft Report and concluded that it appears to have given little consideration to the operating environment of the rural sector, especially ongoing climate variability, a significant decline in rural export prices in real terms, and trade protection on world markets. In such an operating environment, Australian farmers rely on productivity increases through R&D to maintain their competitiveness and profitability. Furthermore, if there were a reduction in co-contributions to the RRDCs, there is a distinct possibility that rural R&D expenditure would decline markedly, leading to a significant decline in agricultural productivity growth, with consequent adverse impacts on regional Australia and the broader community.

ABARE, and the Department, have also examined the preliminary findings with regard to spillover benefits from investment in rural R&D. As acknowledged by the Commission, the quantitative estimation of such benefits is presently difficult. However, ABARE has estimated that the rates of return on government co-contributions are around 30 per cent for the agricultural sector and close to 80 per cent for the Australian economy as a whole. The implied net social rate of return is therefore around 50 per cent, similar to the rate of return on business R&D for the market sector of the economy. The ABARE report is at Attachment 1.

A review (Attachment 2) of investment by RRDCs against the Rural R&D Priorities, which complement the National Research Priorities, shows that around 40 per cent of investment is directed at areas of research and development with substantial spillover benefits. The analysis excluded Land and Water Australia, because the research activities of that RRDC are recognised as being primarily for public good.

We understand that the Council of RDC Chairs will also be making a submission highlighting the social and environmental benefits flowing from RRDC investments. The Council has commissioned ACIL Tasman to develop reporting methodologies that will enable more accurate assessment of the outcomes from R&D investment, including the respective benefits to industries and the community.

In conclusion, the Department considers that a strong case exists to maintain the level of public support for rural R&D, including through the RRDCs.

We again thank you for the opportunity to comment and would be happy to provide further information in support of this submission if required.

Yours sincerely

Ian Thompson
Executive Manager
Rural Policy and Innovation

22 December 2006

Attachment 1

Analysis of the Productivity Commission Draft Research Report
Public Support for Science and Innovation

by

Jammie Penm, Terry Sheales, Roneel Nair and Yeon Kim

ABARE

Prepared for Rural Policy and Innovation Division,
Department of Agriculture, Fisheries and Forestry

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Executive Summary

The Productivity Commission released its draft research report titled *Public Support for Science and Innovation* in early November 2006. In the report, the Commission argued that the level of social benefits associated with rural R&D, especially industry-centred rural R&D, does not justify the extent of public support collectively provided to the sector.

While the Commission's draft research report recognised the severe impact of drought on the rural sector and regional Australia, it appears to have given little consideration to the operating environment of the rural sector, especially ongoing climate variability, a significant decline in rural export prices in real terms, and trade protection on world markets. In such an operating environment, Australian farmers rely on productivity increases through R&D to maintain their competitiveness and profitability.

An implicit assumption underlying the Commission's preliminary findings is that if government co-contributions are removed, the rural industries will increase their contributions to make up for the shortfall. However, without government co-contributions working as an incentive, rural producers may not collectively increase their R&D contributions to make up for the reduction in government support. In the absence of (or in the event of a significant reduction in) government co-contributions, there would be a distinct possibility that rural R&D expenditure will decline markedly.

The major benefit of rural R&D arises from improvements in productivity. Productivity growth in agriculture, forestry and fishing averaged around 2.6 per cent a year over the period 1974-75 to 2004-05 (excluding severe drought years). This is significantly higher than average productivity growth of 1.7 per cent a year in manufacturing, 1.1 per cent a year in mining and 0.8 per cent and 0.7 per cent a year respectively in wholesale and retail trade.

An important consideration in relation to government co-contributions to rural R&D is the benefits and costs associated with such contributions. The Commission's assertion that the level of social benefit associated with rural R&D is not sufficiently high was based on econometric studies in which the estimation results are less than robust with the estimates showing significant disparities.

Using its *Ausregion* model — a comprehensive general equilibrium model of the Australian economy — ABARE estimates that the rates of return on government co-contributions are around 30 per cent for the agricultural sector and close to 80 per cent for the Australian economy as a whole. The implied net social rate of return (50 per cent) is similar to the rate of return on business R&D obtained for the market sector of the Australian economy.

Any reduction in government R&D co-contributions, as suggested by the Commission, can be expected to result in a significant decline in agricultural productivity growth. A consequent significant reduction in farm profitability and incomes will have significant adverse impacts on regional Australia and the broader community.

Background

Commissioned by the Australian Government, the Productivity Commission has undertaken a study into the economic, social and environmental returns from public support for science and innovation in Australia. In early November 2006, the Commission released its draft research report titled *Public Support for Science and Innovation* (PC 2006).

In the draft research report, the Commission presented its preliminary findings on the Rural Research and Development Corporations (RRDCs) model for supporting rural industry research. Particular attention was given to the funding mechanism, whereby there is an Australian government co-contribution of one dollar for every dollar spent by industry on research and development (R&D) up to a ceiling of 0.5 per cent of the industry's gross value of production (GVP).

The Commission's preliminary findings are:

1. *Collective industry research models can provide an effective means of internalising the externalities associated with R&D without the need for public support when those externalities are specific to a particular group. In situations where there is a small number of producers this can (and does) occur on a voluntary basis. But in industries with many firms which are also geographically dispersed, compulsory levies are often necessary to avoid the problem of 'free riders.* (page 9.33)
2. *On the basis of average social rates of return derived in previous studies, the submission by the RRDCs estimated that the net social benefit from the research activity of RRDCs was around 30 per cent per annum. This is not higher than estimates more generally found for R&D. In that instance, the large disparities between high subsidy rates for some industry-centred RRDCs and those applying for other industries may not be justified on economic grounds.* (page 9.36)
3. *On balance, while the Commission sees a strong case for continuing compulsory levy arrangements it considers that on the basis of available evidence, the level of social benefits associated with rural R&D does not justify the extent of public support collectively provided to the sector.* (page 9.36)
4. *However, in considering changes to these arrangements, the Commission is aware of the severe financial situation that many rural producers face over the short to medium term as a result of persistent drought conditions. In this context, a reduced government contribution in the short term would probably not be made up through increased levies, putting at risk R&D that is important for the future sustainability of the sector. This suggests that the present arrangements should remain in place until the effects of the current severe climate conditions have receded.* (page 9.36)

For the so-called 'industry-centred' RRDCs, the Commission stated:

> *There are currently 15 RRDCs (statutory and industry-owned) with all but two of these established to operate with specific industries. In many instance, primary producers contribute to, and benefit from, more than one RRDC.* (page 9.31)

If the above statement fully reflects the Commission's definition of the industry-centred RRDCs, then around 87 per cent of government co-contributions in 2004-05 ($204.7 million) would be regarded as industry centred (equivalent to $177.6 million).

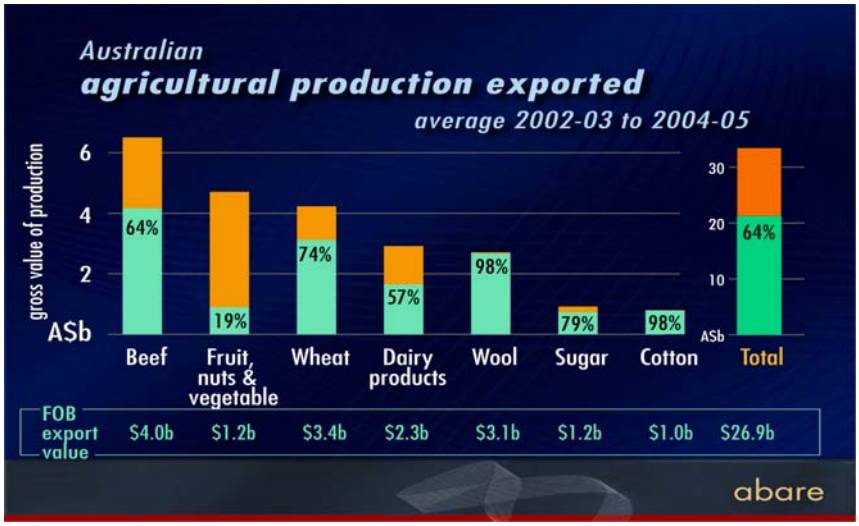
Operating environment of the rural sector

While the Commission's draft research report recognised the severe impact of drought on the rural sector and regional Australia, it appears to have given little consideration to the operating environment of the rural sector. Aspects of the operating environment that are particularly pertinent

to rural R&D are ongoing climate variability, continuing significant declines in rural export prices in real terms, and the effects of protectionism in world markets.

Australia exports around 65 per cent of its agricultural production to international markets (figure 1). Australian rural producers and exporters are price takers on world markets. Over the past three decades, export prices for farm products have declined more significantly than for other exports, including mineral resources, manufacturing and services. Rural export prices (in real terms) declined by an average of around 2.4 per cent a year between 1974-75 and 2005-06 (figure 2). This is higher than the average price decline of around 2.0 per cent a year for mineral resources exports, 1.4 per cent a year for manufacturing exports and 0.8 per cent a year for services exports.

Figure 1



The significant decline in agricultural prices in real terms reflects partly a result of substantial protection and subsidies in international markets that have contributed to global supplies increasing faster than demand. Based on the Organisation for Economic Cooperation and Development estimates (OECD 2006), farmers in many major OECD countries receive significant subsidies and protection. Between 2003 and 2005, for example, farmers in Japan are estimated to have received support estimated to be more than eleven times that received by their Australian counterparts. For other major OECD countries, including major export competitors for Australia (such as the United States and European Union), producer support has also been significantly higher (see table 1).

Figure 2: Australian export prices
1974-75=100

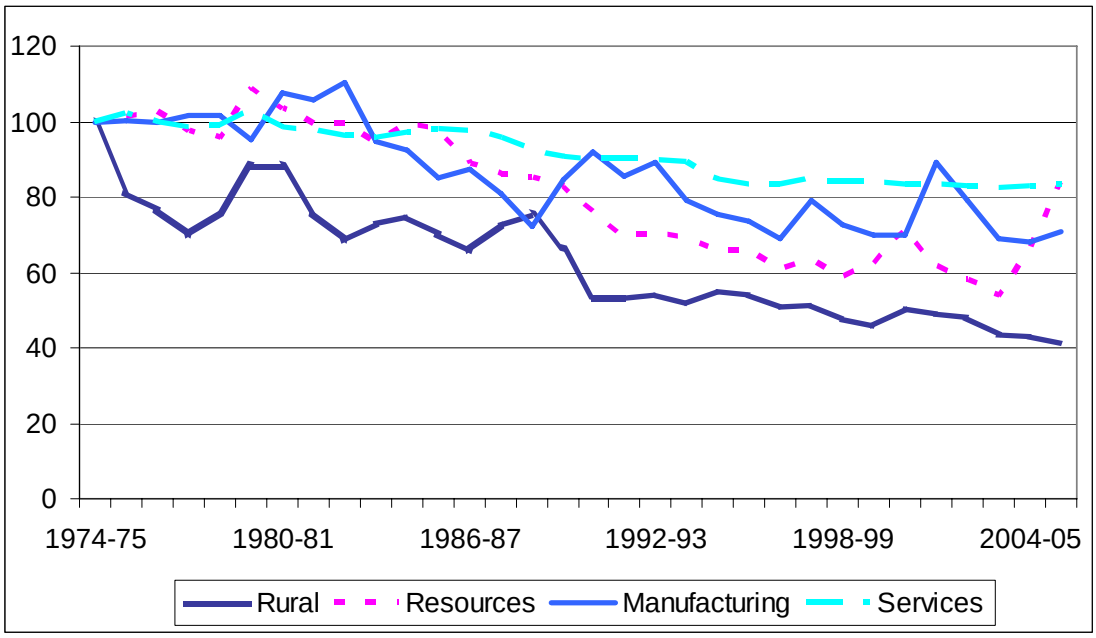


Table 1: **Producer support estimates (PSE) for major OECD countries**[a]

	2003	**2004**	**2005**[p]	**2003-05**
Australia	5	5	5	5
European Union	36	33	32	34
Japan	58	59	58	58
United States	15	16	16	16

a The PSE is an indicator of the annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers. The major support measures are market price support and output and input payments in the United States and Japan and market price support and payments based on area planted and animal numbers in the European Union. In Australia, producer support includes funding under the 2004 Sugar Industry Reform Program and fuel excise tax credits. **P** preliminary. Source :OECD (2006).

Given the significant declines in agricultural prices in real terms, Australian farmers rely on productivity increases to maintain their competitiveness in international markets and, to remain, profitable over the longer term. Any reduction in government R&D co-contributions, as suggested by the Commission, can be expected to result in a significant decline in agricultural productivity growth. This will lead to a decline in the competitiveness of Australian farm exports and hence reduced profitability for Australian farming. A significant reduction in farm profitability and incomes can be expected to have significant adverse impacts on regional Australia, as well as on the national economy.

Economic reasons for government co-contribution

Government co-contributions as an incentive

One of the main reasons for government co-contributions to rural R&D is that, in the absence of such co-contributions, some socially worthwhile R&D would not be undertaken. In other words, government co-contributions are intended to correct for market failure in the provision of R&D in the rural sector.

Under the compulsory levy scheme, there is no guarantee for any individual farmer that the research effort will be directed to solve problems of particular relevance to that farmer's operations. When a farmer leaves the industry or a sector, there is unlikely to be any market compensation for contributions to R&D funding in the sense that a manufacturer, for example, may sell licences, patents and ongoing research programs. It is unclear whether R&D benefits will be captured by individual farmers, fully or in part, through increases in the land values.

An implicit assumption underlying the Commission's preliminary findings is that, if government co-contributions are removed, the rural industries will increase their contributions to make up for the shortfall. There is no evidence to suggest this will happen. Although the compulsory levy scheme overcomes some aspects of market failure, it is dependent on the industry's 'goodwill' in terms of how much the industry contribution to R&D will be. Without government co-contributions working as an incentive, rural producers may not increase their R&D contributions. Anecdotal evidence suggests that boards of individual rural bodies use the existence of matching government funding as an incentive to encourage rank and file members to agree to pay levies to support research and development. Thus, in the absence of (or a significant reduction in) government co-contributions, rural R&D expenditure may decline markedly.

In the policy statement associated with the establishment of the RRDCs, the principles with regard to the level of R&D resources which should be spent on agriculture were stated as follows (Kerin and Cook 1989).

> *The Government does not believe that total spending of 1 per cent of the commodity's GVP is the appropriate level of industry research and development activity. It should, for most industries, be regarded as a minimum. By the time this minimum is reached, however, industry should itself determine whether the increased funding is warranted. If it is, the industry should fund it.*

This is consistent with the dollar for dollar matching contribution, up to 0.5 per cent of the gross value of production, acting as an incentive for rural R&D investment, encouraging farmers to focus on the benefits of R&D. Farmers may collectively decide to increase their R&D investment to an amount greater than 0.5 per cent of GVP if they perceive there to be sufficient private benefits from the additional spending.

Agricultural industries have been increasing their contributions to R&D (defined as 'business R&D'). Total investment in agricultural R&D is estimated to have been approximately $1.28 billion in 2004-05, a rise of around 20 per cent in real terms since 1996-97 (ABS 2006). As a share of total agricultural R&D investment, business R&D investment has increased from around 8 per cent to an estimated 18 per cent over the same period, while government co-contributions have remained relatively stable.

Social spillovers from rural R&D

There is substantial qualitative evidence that there are large spillovers from rural R&D to the rest of the economy, especially compared with research in other sectors such as manufacturing.

In its final report for the Inquiry into Research and Development released in May 1995, the Industry Commission accepted economic arguments that research involved significantly greater spillover benefits in agriculture and related industries than in other sectors (IC 1995).

Under the heading of 'Spillovers to the Wider Community', the Industry Commission said:

> *Certainly some environmental research undertaken by rural industries generates knowledge which has a wider application than merely in agriculture. However, environmental research can be viewed in two ways. From one perspective it can be regarded as generating positive spillovers because it can lead to greater environmental amenity and reduced costs to the community. … The other way is to see it as reducing the negative spillovers associated with farming.* (page 722)

> *The Commission considers that much rural research yielding health or environmental benefits can provide sufficiently large private benefits to give farmers an incentive to fund it. However, it is also true that much environment related research will not generate large enough private benefits for it to proceed without a subsidy.* (page 724)

The Industry Commission concluded:

> *The high level of government funding of rural R&D, relative to other sectors, has been largely a response to the atomistic nature of farming and the high potential for spillovers. The problem of spillovers within the sector can be addressed through collective funding arrangements, which have been the basis for an important innovation in policy in recent years through the matched levy funding of rural research corporations.* (page 37)

It is noteworthy that, over the past decade, there has been an increase in demand for socially worthwhile rural R&D, such as plant and animal health, biosecurity and quarantine, improved environmental management, and improved adaptiveness to climate factors in farming. As a result of this increase in demand, and RRDC responses to these demands, it would be reasonable to expect that there has also been an associated increase in social spillovers from rural R&D.

While some spillovers beyond the rural sector can be quantified by conventional methods, some rural R&D projects also generate 'unmeasurable' effects on the rest of the economy. For example, the research and development aimed at achieving better water use efficiency, especially in broadacre crops, have private benefits, but they also have substantial social benefits through their effects in the environment.

Estimated benefits from rural R&D

One important factor underpinning the Commission's preliminary findings is its views about the net social return from rural R&D relative to R&D activity in other sectors of the economy. The Commission argues that if the social net return of rural R&D is not higher than the return on R&D activity in other industries, then current amounts of co-contributions provided by the government to rural R&D cannot be justified on economic grounds.

The Commission's assertion that the level of social benefit associated with rural R&D is not higher than estimates more generally found for R&D in other industries appears to be based on two sources. One is the submission prepared by the RRDCs (RRDCs 2006) and the other is the results from some previous studies, including one undertaken recently by the Commission (Shanks and Zheng 2006).

The submission by the RRDCs cited a survey undertaken by Salter and Martin (2001) of econometric estimates of the rate of return on publicly funded basic research in the area of agriculture (see table 2) and the social rate of return on private R&D investment (see table 3).

Table 2: **Estimates of rate of return on publicly funded agriculture related R&D**

Studies	**%**
Griliches (1958)	20-40
Peterson (1967)	21-25
Schmitz-Seckler (1970)	37-46
Griliches (1968)	35-40
Evenson (1968)	28-47
Davis (1979)	37
Evenson (1979)	45
Davis and Peterson (1981)	37
Huffman and Evenson (1993)	43-67

Source: Salter and Martin (2001). For references listed above, see Salter and Martin (2001).

Shanks and Zheng (2006) estimated the rate of return on business R&D for manufacturing, mining, wholesale and retail trade and the market sector, as well as publicly funded R&D for agriculture (table 4). They argue that a gross return of 50 per cent for the market sector of the Australian economy is well within the range of plausible estimates (page 229).

While significant attempts were made by the Commission and in previous studies to estimate the rates of return on rural R&D activity, the results are less than robust with the estimates showing significant disparities.

Table 3: **Estimates of social rate of return on business R&D**

Studies	**%**
Nadiri (1993)	50
Mansfield (1977)	56
Terleckyj (1974)	48-78
Sveikauskas (1981)	50
Goto and Suzuki (1989)	80
Mohnen and Lepine (1988)	28
Bernstein and Nadiri (1988)	10-160
Schere (1982, 1984)	64-147
Bernstein and Nadiri (1991)	20-110

Source: Salter and Martin (2001). For references listed above, see Salter and Martin (2001).

Table 4: **Estimates of rate of return on business R&D from Shanks and Zheng (2006)**

Manufacturing	Mining	Wholesale & retail trade	Agriculture[1]	Market sector
50%	159%	438%	24%	50%

1 Publicly funded R&D.

For example, as presented in Table 2, the estimates obtained from previous studies for the rate of return on publicly funded basic agricultural research range from 20 per cent to 67 per cent. The estimates for the social rate of return on business R&D range even wider, from 10 per cent to 160 per cent.

The large disparities shown in these estimates raise concerns about the use of average rates of return for agriculture and the economy as a whole to derive the net social rate of return on rural R&D (defined as the difference between the social rate of return for the economy and the rate of return for agriculture). There is little evidence that the derived net social rate of return of 30 per cent adopted by the Commission is a reliable estimate of the 'true' level of social benefit of rural R&D. If the extreme estimates of 160 per cent for the social rate of return for the economy and 20 per cent for the rate of return for agriculture were used in the calculation (see tables 2 and 3), the estimate of the net social rate of return on rural R&D would be as high as 140 per cent.

Similarly, significant disparities were also obtained by Shanks and Zheng (2006) on the rate of return estimates for different industries. For agriculture, the rate of return on publicly funded R&D was estimated at 24 per cent. This estimated rate of return is close to the bottom end of those obtained from previous studies. In contrast, the estimates of rate of return on business R&D for other industries are significantly higher, ranging from 50 per cent for both manufacturing and the market sector as a whole to 159 per cent for mining and 438 per cent for wholesale & retail trade.

The rate of return estimates for mining and wholesale and retail trade presented by Shanks and Zheng (2006) appear to be unrealistically high and this raises concerns about the robustness of the estimation results.

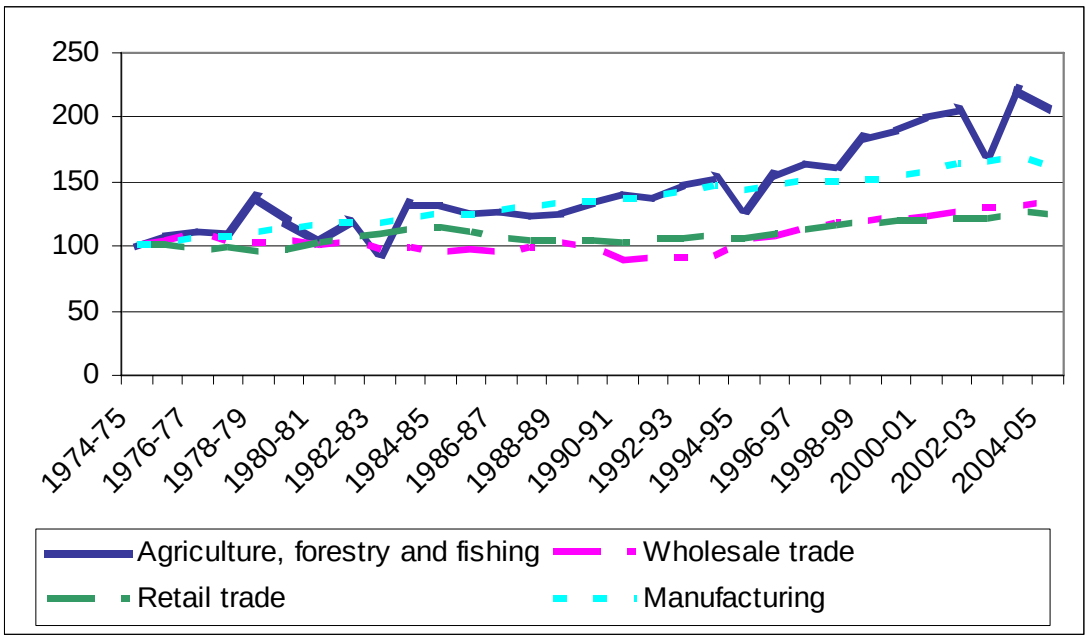
Benefits of government co-contributions to rural R&D

An important consideration in regard to government co-contributions to rural R&D remains the benefits and costs associated with such contributions. To make a contribution worthwhile, the research induced by it should earn a return that is sufficient to at least cover the cost of such funding.

Higher productivity growth in the rural sector

The major benefit of rural R&D arises from increases in productivity. Examining productivity growth in the rural sector will provide an indication of the success of the government co-contribution scheme. Based on Productivity Commission estimates, productivity growth in agriculture, forestry and fishing averaged around 2.3 per cent a year over the period 1974-75 to 2004-05. After removing from the calculation those years during which farm production declined significantly due to adverse seasonal conditions (namely 1980-81, 1982-83, 1994-95 and 2002-03), the average rate of productivity growth increases to 2.6 per cent a year over the same period.

Figure 3: Industry productivity



Agricultural production, as measured by ABARE's index of farm production, achieved average growth of 2.6 per cent a year over the same period (or 3.0 per cent a year excluding the drought years). Combined with the productivity growth estimates, these results indicate that, over the past three decades, productivity growth has contributed to around 87 per cent of the increase in agricultural production.

Productivity growth in the rural sector has been significantly higher than other industries in the Australian economy (figure 3). Over the same period, productivity growth averaged around 1.7 per cent a year in manufacturing and 1.1 per cent a year in mining. For wholesale and retail trade, the average annual productivity growth was around 0.8 per cent and 0.7 per cent respectively between 1974-75 and 2004-05.

The significantly higher rural productivity growth is likely to be attributable in large part to the effectiveness of the government co-contribution scheme. In 2004-05, for example, the government co-contributions to rural R&D were around $204.7 million, compared with an estimated total investment in agricultural R&D of approximately $1.28 billion. The share of Australian government co-contributions in total agricultural R&D investment has been around 16 per cent over the past years. Using this share as an approximation, government co-contributions would have led to, at least, an increase of around 0.42 percentage points a year in average rural productivity growth.

Because government co-contributions stimulate responses of private sector investment in rural R&D, the proportion of agricultural productivity growth that is attributable to government co-contributions is likely to be higher than 0.42 per cent a year.

Effect of a reduction in government co-contributions

An important question relating to government co-contributions is what would be the cost to the Australian economy if growth in agricultural productivity slows as a result of the abolition of government co-contributions. That is, what would be the effect of removing government co-contributions if there were no compensating increase in private funding of rural R&D? To examine this issue, ABARE's *Ausregion* model was utilised to quantify the impacts on agricultural production and Australian gross domestic product of lower rural productivity growth.

The simulation results also provide an indication of the magnitude of the rates of return on government co-contributions for the agricultural sector and the economy as a whole.

Ausregion is an ABARE developed general equilibrium model of the Australian economy and contains comprehensive economic linkages and interdependencies between regions. The model can be used to estimate regional and national effects of changes in productivity growth, and flow-on implications. More information on *Ausregion* can be found on ABARE's website (http://www.abareconomics.com/research/models/ausregion.htm).

The estimated effect of a 0.42 percentage points reduction in agricultural productivity growth are presented in table 5. The results indicate that, as a result of lower agricultural productivity growth, growth in agricultural production would be around 0.7 percentage points lower than would otherwise have been the case. For Australia as a whole, economic growth would be around 0.04 percentage points lower than would otherwise have been the case.

In 2004-05 dollars terms, these estimates indicate losses of agricultural production and gross domestic product (from removing government co-contributions) of around $266 million and $368 million a year respectively. Compared with government co-contributions in 2004-05 ($204.7 million), the rates of return on government co-contributions would be around 30 per cent for the agricultural sector (dividing $266 million by $204.7 million and subtracting the result by 1) and close to 80 per cent for the Australian economy as a whole. These results indicate a net social rate of return of around 50 per cent on government R&D co-contributions, a figure that is similar to the rate of return on business R&D obtained by the Commission for the market sector of the Australian economy (Shanks and Zheng 2006, page 229).

Table 5: **Simulation results from *Ausregion***

Effects of a reduction of 0.42 percentage points in agricultural productivity growth due to assumed removal of government co-contributions

Impact on		In 2004-05 dollars	
GDP	Agriculture	GDP	Agriculture
-0.04%	-0.7%	$368 million	$266 million

It is noteworthy that this estimated net social rate of return on government co-contributions does not include intangible or unmeasurable social benefits from rural R&D. Those would include environmental and consumer health benefits as a result of improved on-farm practices, such as water management and improved use of fertilisers, pesticides and chemicals, and food safety gains, respectively.

References

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The Department has completed an analysis of individual investments made by industry RRDCs (not including Land and Water Australia) against the seven Rural R&D Priorities. These priorities are described below in Table 1, matched to relevant National Research Priorities.

Table 1:

National Research Priority	**Rural R&D Priority**
An environmentally sustainable Australia	Sustainable resource management
Frontier technologies for building and transforming Australian industries	Use of frontier technologies
	Creating an innovative culture
Promoting and maintaining good health (through strengthening Australia's social and economic fabric)	Improving competitiveness through a whole of industry approach
	Maintaining and improving confidence in the integrity of Australia agriculture, food, fish and forestry products
	Improved trade and market access
Safeguarding Australia	Protecting Australia from invasive diseases and pests

Table 2 below describes expenditure by RRDCs against each of the Rural R&D Priorities.

Table 2:

Estimated 2004-05 expenditure by reporting industry centred RDCs on public good research priorities[1]

Rural Research Priority	FRDC ($,000)	FWPRDC ($,000)	SRDC ($,000)	CRDC ($,000)	GRDC ($,000)	RIRDC ($,000)	*Priority total ($,000)*	*Priority total*
1: Sustainable Natural Resource Management	10,750	-	2,900	1,600	17,110	2,400	*34,760*	*18.4%*
2: Improving Competitiveness through a Whole of Industry Approach	5,100	800	2,700	500	52,660	10,600	*72,360*	*38.2%*
3: Maintaining and Improving Confidence in the Integrity of the Australian Agriculture, Food, Fish and Forestry Products	-	2,030	200	160	2,220	3,080	*7,690*	*4.1%*
4: Improved Trade and Market Access	920	800	110	500	5,840	1,450	*9,620*	*5.1%*
5: Use of Frontier Technologies	140	1,200	2,200	4,150	13,240	2,470	*23,400*	*12.4%*
6: Creating an Innovative Culture	2,470	1,200	3,500	4,100	10,360	2,500	*24,130*	*12.7%*
7: Protecting Australia from Invasive Diseases and Pests	1,090	-	200	25	15,680	400	*17,395*	*9.2%*
Estimated total spending on public good R&D (priorities 1,6,7) ($,000)	*14,310*	*1,200*	*6,600*	*5,725*	*43,150*	*5,300*	*76,285*	*40.3%*
Total spending on R&D ($,000)	*20,470*	*6,030*	*11,810*	*11,035*	*117,110*	*22,900*	*189,355*	
Estimated proportion of total spending on public good R&D	**69.9%**	**19.9%**	**55.9%**	**51.9%**	**36.8%**	**23.1%**	***40.3%***	

[1] Using annual report figures provided by industry RDCs for 2004-05 (excluding Land and Water Australia) total average expenditure against all Rural Research and Development Priorities (RRPs) were generated and total percentage expenditures calculated. RRPs 1, 6 and 7 are considered those with greatest socio/environmental objective.