Productivity Commission Inquiry into the Australian Government Research and Development Corporations Model

Response to Draft Report

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Executive summary

AgForce is the peak lobby group representing the majority of beef, sheep & wool, and grain producers in Queensland. AgForce represents around 7,000 members and exists to ensure the long term growth, viability, competitiveness and profitability of these industries. This is why we are very interested in how rural R&D is managed and delivered. AgForce agrees with the Productivity Commission (PC) finding that the joint government-industry co-investment model for research and development (R&D) funding through the Rural Research and Development Corporations (RDCs) is fundamentally sound. This partnership has achieved good returns on investment and significant benefits for primary producers and the wider community.

AgForce is strongly opposed to any reduction in the Australian Government's contribution or commitment to the current partnership. By 2050 the world's agricultural system must increase food production by about 70% if a global population forecast to be around 9 billion is to be adequately fed. As a significant food exporter, Australia will play a role in meeting these global challenges, in addition to meeting domestic market requirements for safe, affordable, high quality food. We will need to do this while adjusting to the issues of climate change and resource scarcity. These outcomes will require a well-resourced innovation chain to achieve the necessary productivity increases and supply of skilled personnel. On this basis the Australian Government, and those of other developed countries, should increase public funding support for food-production-related R&D.

We question the Commission's assertion that the Commonwealth's contribution has mainly supported R&D that private investors would have otherwise funded. The Australian Farm Institute has a report in preparation which provides evidence suggesting the public co-contribution through the RDCs is complementary to, and acts as a motivating force for, private agri-business investment. Further, there are industry-specific disincentives to increased primary producer investment in R&D. These include the long-term, low average profitability of broadacre industries, the long lag times between investment and accrual of returns, and the rapid flow-through of benefits to consumers and other parties. Therefore public funding reductions as recommended are unlikely to be offset by increased private investment.

It is AgForce's view that a reduction in public funding would send the wrong message and act to increase market failure existing in the supply of appropriate human capability in rural R&D. This would be particularly apparent for scientific skills due to long lead-in training periods, with flow-on effects through to Australia's overseas aid programs. The Commission's suggestion that Australia would be better served financially by focussing on adapting overseas R&D would not in our view appropriately account for Australia's unique production environment nor the reciprocal knowledge-sharing arrangements that are necessary to engage effectively with overseas research providers.

To provide a better basis for recommendations about the appropriate quantum of public funding within the RDCs it would be preferable to include the wider rural R&D investment context. This would include accounting for the National RD&E Framework process, the National Strategic Rural R&D Investment Plan and a DAFF review of funding flows. The lack of an appropriate system for valuing broader community 'public good' outcomes from rural R&D is hampering efforts to properly

evaluate the RDC model and rural R&D more broadly. It is suggested this limitation be identified by the PC as an area warranting further investigation and investment.

AgForce accepts there needs to be a set of clear guiding principles for public investment, such as those outlined in Recommendation 5.1, that are aimed at enhancing productivity, competitiveness and social and environmental performance of the rural sector and the welfare of the wider community. But AgForce would see the inclusion of the phrase '*by inducing socially valuable R&D that would not otherwise be undertaken'* as being too restrictive in not allowing for the spillover benefits that don't specifically include R&D, and that 'R&D that would not otherwise be undertaken' is difficult to measure. We also question whether public funding programs for rural R&D are the most appropriate mechanism for facilitating structural adjustment in the sector.

The renewed focus by the Commission on cross-sectoral R&D issues is welcomed by AgForce, particularly following the closure of Land and Water Australia. We consider that innovation and productivity improvement must be approached holistically, incorporating social and environmental factors. Primary producers manage over 50% of Australia's land area and so are central to the implementation of cross-sectoral R&D findings. Therefore these cross-cutting findings must be integrated effectively into production-focussed R&D recommendations, and have a degree of ownership by primary producers, in order to maximise levels of on-ground adoption.

Establishment of the Rural Research Australia RDC as proposed would set up an artificial distinction between private and public good activities, involve significant additional administrative expenditure, increase the potential for competition for scientific expertise with the industry RDCs but with the added advantage of consistent public funding, and instil the need to recreate networks with industry. AgForce would like clearer assurances that RRA's intended governance arrangements and the process of R&D priority setting would maintain strong landholder involvement. Significant cross-sectoral R&D is already underway within the RDCs but requires improved co-ordination and clarification of the Government's expectations. With these issues and the proposed reduction in the Government's co-contribution in mind, AgForce considers that cross-sectoral R&D delivery is better maintained within the current structure, with appropriate co-ordination and Government input.

In terms of the principles guiding the future operations of the RDC program, AgForce supports attempts to streamline & co-ordinate R&D delivery within the total framework to achieve better value for money. We agree with the Commission that RDC boards should be skills and experience based, and this will likely solve many of the RDC underperformance issues. AgForce considers that the appointment of a voluntary government director may also contribute to improving co-ordination of efforts across the RDCs, including on cross-sectoral issues. Their appointment should also be skills-based and include a requirement for recognised experience of the industry involved. Evaluation is seen as an important contributor to continuous improvement but should be cost-effective.

AgForce supports the current joint Australian Government-industry co-investment model for R&D funding where there is effective industry consultation and direction of R&D priorities and the inclusion of integrated extension programs to promote adoption of research findings. Given the significant challenges facing broadacre agriculture and the public benefits that accrue from rural R&D investment, an equal public and private sector commitment to agricultural innovation is vital.

Support for RDC model

AgForce agrees with the Commission's finding that the joint government-industry co-investment model through the RDCs is fundamentally sound. The current RDC model was enabled by the Primary Industries and Energy Research and Development Act 1989 to '*make provision for the funding and administration of R&D relating to primary industries with a view to:*

(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

(b) achieving the sustainable use and sustainable management of natural resources

(c) making more effective use of the resources and skills of the community in general and the scientific community in particular

(d) improving accountability for expenditure upon R&D activities in relation to primary industries.'[1]

We would highlight that the objectives of the Act provides for benefits of primary industries R&D to accrue to both the members of industry as well as the wider community, with private and public benefits being treated together not separately in these objectives.

Returns on rural R&D investment

As outlined in Appendix B of the draft report, there is quite an extensive literature citing the benefits of agricultural R&D investment, including international[2,3] and Australian-focussed studies[4]. Rates of return are broadly in line with the 15 to 40% level proposed by Mullen and co-investigators. The consistency with which respected academics through peer-reviewed publications have drawn the conclusion that rural R&D is both important to productivity gains and has produced good returns would indicate that significant benefits have actually been achieved, and marginal rates of return on investment are still high. While the Productivity Commission (PC) recommends caution in interpreting these results (P250), they also conclude that *'the empirical evidence viewed in an overall sense is suggestive of good returns to investment in rural R&D'*. AgForce would call on the PC not to discount these studies in drawing their conclusions about appropriate public funding levels and the supporting funding principles.

The PC disputed (P253) the policy value of the study by Sheng *et al*. (2009) which pointed to industry specific declines in productivity growth due to declining R&D investment. ABARE has recently revised its productivity growth measures since 1953 from 2.5% to 2% per annum, with a decline of -1.4% per year in the decade to 2007[5]. In terms of attribution of productivity growth to R&D, the PC cautions that other factors, such as farm consolidation (P255), improving educational attainments, and the removal of trade barriers are also drivers of productivity improvement (P41). It should be remembered that rural R&D, both domestic and international, also plays a role in underpinning these other factors. For example, farm consolidation is enabled by improvements in both production

[1] www.austlii.edu.au/au/legis/cth/consol_act/piaerada1989531/s3.html, accessed 4/11/2010.

[2] Alston et al., 2000

[3] Alston et al., 2009

[4] Mullen, 2007

[5] Mullen, 2010

techniques and communication technologies that result in greater labour efficiency and capacity, and trade is built on improved product transportation, processing and storage technologies.

Context for rural R&D investment

Within the global system, agriculture is facing significant challenges. In June 2010, OECD and the United Nations predicted a 40% rise in food prices by 2020[6]. The world's population is forecast to rise to 9 Billion around 2050, with the concurrent challenges of scarcity in water, productive land, oil, phosphorus and agricultural R&D investment[7], overlain by climate change effects. CSIRO and the Bureau of Meteorology predict up to 20% more drought-months over most of Australia by 2030[8] with predictions of droughts occurring 1 in every 2 years by 2040 under a 'business as usual' scenario[9]. Australian agriculture is projected to be one of the most adversely affected from climate change, and potentially faces more extreme impacts than its competitors[10]. As Australia currently exports about 60% of produced food commodities it is heavily exposed to international trade fluctuations and needs to achieve strong productivity gains to remain competitive and continue to deliver safe, affordable and high quality food for our domestic market.

Whatever the magnitude of R&D support existing, all governments of developed countries are currently under-investing in rural R&D given these emerging challenges[11,12]. Public investment in rural R&D in Australia has declined over the past 10 years and real research intensity (proportion of GDP) has been declining since the early 1980s, with reports of an apparent decline in multifactor productivity since 1998[13]. The Commission's recommendations if adopted would see a continuation of those declines.

Australia is a relatively small player in global agricultural R&D investment, contributing about 3% of the total knowledge gains[14]; however as a significant exporter of food products and technical expertise our capacity to continually improve productivity will be important in meeting the global food challenge. As a country Australia needs a well resourced innovation chain to achieve ongoing productivity increases and skilled personnel. AgForce strongly supports continued, and increased, Australian Government investment in RD&E activities to ensure the increasing productivity, sustainability and global competitiveness of Queensland's cattle, sheep and grain industries under difficult global conditions.

Underinvestment market failure

The PC has calculated that public funding supplied about 75% of the agricultural R&D funding in 2008/09 (P11), although due to difficulties in obtaining robust investment information (P103) this

[6] OECD-FAO Agricultural Outlook 2010-2019
[7] Cribb, 2010
[8] www.climatechangeinaustralia.gov.au/technical_report.php, accessed 29 October 2010
[9] The Climate Institute, 2010
[10] www.climatechange.gov.au/climate-change/impacts/agriculture.aspx, accessed 29 October 2010
[11] Alston et al., 2009
[12] Cribb, 2010
[13] Mullen, 2007, 2010
[14] Core, 2009

estimate may be high[15]. This level of investment is considered by the PC to be generous in comparison to other sectors of the domestic economy (P152) and a high proportion of the total compared with other agricultural industries overseas (P35, P162). This perception appears to be part of the rationale for a proposed reduction in the Government's co-contribution levels. The PC makes the argument that such generous public funding of rural R&D has probably resulted in a substitutionary effect, whereby public dollars have displaced private investment that would otherwise have occurred. The Commission considers that the economically rational decision would be for primary industries to offset any reduction in public funds due to the intrinsic private financial incentive, regardless of the wider public good. This assumption is questioned on a number of fronts.

Domestic sector comparisons

There is significant public expenditure on research across most areas of the Australian economy[16], and specific sectors that also receive large tariff and other supports. While the PC has suggested inappropriate levels of existing assistance (P158 of Draft report), the textile, clothing and footwear (TCF) and motor vehicle and parts (MVP) sectors continue to receive large subsidies including of the most trade distorting kinds. In 2006/07, the TCF sector received assistance equivalent to $550 million in net terms, with tariffs accounting for 75% of net assistance[17]. These translate to an effective rate of assistance of 12%, or 3 times the average for the manufacturing sector as a whole, and 2 to 4 times that of Australian agriculture[18]. Similarly in the same year, the MVP industry received an estimated net subsidy equivalent of $1.26 billion from tariff and budgetary measures, equivalent to $23,500/worker (based on employment levels of 48,000) and $25.5 million worth of assistance through R&D grants and tax concessions[19]. Comparisons of Government support of different sectors of the economy will invariably lead to qualitative judgments about relative value for money to society, an area where agriculture has consistently demonstrated good returns and has a strong case for continuation of support.

Overseas comparisons

Comparisons by the Commission (P162) with other developed countries about public support for rural R&D is potentially misleading because trade protections or farm subsidies in those countries enable their industries to achieve a greater level of private R&D investment. Figures from the OECD[20] indicate that Australia provides its farmers with the second lowest levels of government support. Of the countries the PC compares Australia against, the US, EU and Canada provided more than double the relative level of support. Farmers in the US and Canada enjoy a greater, albeit declining, level of government support in other areas of their business. For example, marketing and promotion compose about 75% of the general services support that farmers in the US received from 2007 to 2009, and about 25% of the support of Canadian farmers. Overall these supports, such as output subsidies, would leave those overseas producers in a better position to make private contributions to R&D in comparison to less supported Australian producers. These supports may also artificially

[15] Keogh and Potard, 2010
[16] Core, 2009
[17] Productivity Commission, 2008a
[18] OECD, 2010
[19] Productivity Commission, 2008b
[20] OECD, 2010

boost perceived returns from agricultural R&D[21]. Further, Australia also has very low barriers to international agricultural and food trade, namely a 0 to 5% import tariff range and a tariff impact on these imports equal to 1.2%[22]. So while not arguing for the use of publically funded R&D as a counterweight to overseas governmental subsidies, or the unequal competition with importers for our domestic market, the data suggests a comparison of the level of private vs. public support in Australia for rural R&D should include corrections for these factors.

Substitutionary versus complementary public investment

Private investment in agricultural R&D has been rising as a proportion of overall investment. When food and agriculture are included, the sector's share of total investment averaged 54% for OECD nations in 2000, up from 44% in 1981[23]. The PC considers that public funds have been substituting for private investment (P171) however a report under preparation by Keogh and Potard (2010) indicates that the findings of a survey of 50 agri-business firms investing over $1 million p.a. in R&D were that these firms saw the activities of the RDCs as complementing their activities. Of these firms, 40% indicated they would reduce their investment levels in response to a 50% decrease in investment by the RDCs and 55% would increase their investment were RDCs to increase levels by 50%. The study also highlighted that motivating factors behind private investment include the level of public R&D investment and public/private sector interactions. While any survey of investment motivations can be subject to future self-interest distortions, these findings indicate that the Government's co-contribution is a strong motivating force for private agribusiness investment.

Further these findings suggest that a reduction in co-contributions by Government or levy-payers to the RDCs would have a flow-on effect within the wider rural R&D framework resulting in even greater reductions in R&D investment intensity. AgForce recommends that the PC examine this data and robustly establish the likely full impacts within the wider rural R&D system that would flow from a reduction in public funding to the RDCs.

Capacity for additional investment

The 2008/09 Agricultural Survey revealed that the number of businesses undertaking agricultural activity in Australia had fallen to a total of 136,000 businesses[24], down from 146,400 in 1999/2000[25]. This reflects a long term trend in industry rationalization: that this process has underpinned some of the productivity gains observed is not in dispute. However the underlying fragility within different commodity sectors is greater than the PC appears to realize. The ABARE Farm Survey results for 2010 indicate that in 2007/08 farm cash incomes for broadacre industries in Queensland averaged $69,560, with a business profit of $18,090, translating to a 1.2% rate of return on opening capital (1.4% if include capital appreciation)[26]. Farm cash incomes for 2009/10 are projected to fall to 45% below the average recorded for the 10 years to 2008/09. These returns are subject to significant industry specific and inter-annual variability, often due to uncontrollable global factors.

Case study: Queensland beef industry.

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[21] Frontier Economics, 2009
[22] Brown et al., 2008
[23] Keogh and Potard, 2010.
[24] ABS, 2010
[25] ABS, 2001
[26] ABARE, 2010

At the end of June 2009, 32% of the nation's 39,425 beef farms were located in Queensland, totalling 11.76 million cattle with a gross value of production of $3.4 billion[27]. McCosker *et al.*[28] reported that average return on assets for surveyed northern Australian beef producers (mainly Queensland but including some in the NT and WA) has declined to very low levels (0.3 to 2.0% per annum) with about half of the producers studied spending more than they earned in 6 of the past 7 years. This has resulted in a doubling of debt levels per stock unit over the decade. This is generally reflective of the average financial performance of the national beef industry. Average farm cash incomes and business profit has remained fairly constant around the breakeven point from 1977/78 to 2008/09, although the top 25% of producers have shown a trend towards improved profitability[29]. With increasing local council rates, leasehold land rental rates and real input costs, the actual capacity of beef producers to make a profit, service debt and other overhead costs is declining. Under these conditions additional levy payments over and above current levels will have a disproportionately large effect, as highlighted for the dairy industry in the draft report (Page 59).

In the last decade, prolonged drought, intensifying competition for land from the mining industry, and rising input costs has put considerable pressure on Queensland's cattle, sheep and grain farmers. The sustained high Australian dollar compounds the difficulties facing our export-oriented industries. AgForce suggests that primary producers in Queensland are not in a position to increase their R&D levy-payments despite the achievement of high returns from R&D investment in the past.

Lag times between investment and return

In addition to ongoing low profitability, there are also issues around the lag time between initial R&D investment and the subsequent returns for both productivity increases[30] and spillover environmental and social outcomes. It has been estimated that productivity benefits from agricultural R&D happen over decadal timeframes, and even longer for environmentally-focused work. The age of the farmer population is increasing (median 52 years in 2006, up from 51 in 2001; 18% were over 65 years in 2006, up from 15% in 2001[31]). This age structure, the ongoing reduction in farm business numbers, and fewer properties being handed down within families means these long lag times from investment to realized benefits acts as a significant disincentive for private investment and potential for increases in levy payments.

The current partnership with Government has been motivating producers to co-invest, but with long lag times and unclear connections between investment decisions and resulting benefits on-farm there is likely to ongoing relative underinvestment by levy-payers in rural R&D. In principle any decline in productivity from a slowdown in R&D will eventually increase incentives for investment as reductions in product supply relative to demand drives price increases. However, given global markets and the long lag times from research to application, a market-based mechanism is likely to be ineffective and involve significant social and opportunity costs.

Inadequate capture of the benefits of private R&D investment

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[27] DEEDI, 2010
[28] McCosker et al., 2010
[29] http://www.abareconomics.com/AME/mla/mla.asp, accessed 13/10/2010
[30] Alston et al., 2009
[31] ABS, 2006

Manufacturing, Mining, Property and business services, and the Finance and insurance sectors have the greatest business sector expenditure, with Retail trade, Agriculture, fishing and forestry, and Transport and storage demonstrating the lowest levels of investment[32]. In the past private R&D investment in the agriculture, forestry and fisheries sectors has been very low, in line with the retail sector[33] which also has issues around excludability of R&D findings from competitors. Larger firms with a greater market share and those with a greater ability to capture the benefits from R&D were key characteristics of private sector investors in rural R&D[34]. Private investors can receive a return on investment provided they can secure intellectual property rights or keep R&D outcomes in-house, and this ability will vary between industries. Once R&D knowledge and technology is collectively available, as occurs under the current system, there is ongoing erosion of the benefits for individual producers to both competitors and to consumers.

Inexpensive, safe and high quality food for consumers

The Australian Government's National Research Priorities and its underlying economic policy are aimed at improving societal well-being, including standards of living. Agricultural R&D has had a direct role in assisting in the delivery of inexpensive, high-quality food to Australian domestic consumers and provides consumers both in Australia and overseas with confidence that the food on offer is safe to eat. Australian consumers spend less of their weekly earnings on food than ever before, and while market liberalisation has certainly played a part, productivity improvements through innovation have also enabled this benefit to occur.

Producers receive benefits from R&D mainly due to cost efficiencies (e.g. via increased output allowing spreading of overhead costs), and potentially increased market share, but this efficiency dividend is quickly dissipated for individual producers as their competitors adopt the innovation as well[35]. Consistent with this, Australian farmers have experienced ongoing erosion in their terms of trade for at least the past 60 years although this has slowed to 1% per annum since the late 1980s[36]. They are also increasingly bearing the cost of government regulations designed to achieve public good outcomes, with a limited capacity to pass on these and other input costs.

In comparison the positive spillover benefit of relatively cheaper food to consumers is maintained due to increases in overall industry efficiency. The PC indicated (P57) that '*If producers collectively perceive that most of the benefits from their levies are likely to be appropriated by consumers, their willingness to pay levies may be reduced*'. In their initial submission to the PC (P18), MLA lists some examples of where domestic consumers appropriate a greater share of the benefits of innovation than producers themselves.

When we compare the long term, low profitability of broadacre agriculture against the data that consumers in Australia waste about $5.2 billion worth of food annually[37] or about $230 per person, it points towards an uneven distribution of benefit for R&D into food production. Further, RDCs play

[32] Core, 2009
[33] Core, 2009
[34] Keogh and Potard, 2010
[35] Barnes, 2001
[36] Mullen, 2010
[37] www.tai.org.au/index.php?q=node%2F19&pubid=695&act=display, accessed 4/11/2010

a valuable role in promoting community education around food and healthy dietary choices, as well as improving food safety and product integrity, both areas with positive spinoff benefits in reducing healthcare costs[38]. In the form of inexpensive, safe and high quality food taxpayers as consumers have received significant ongoing value for the $1.1 billion of public funding going towards rural R&D (Draft report P12).

Summary

These factors would suggest that the Government's co-contribution has been complementary and motivating rather than substitutionary. Additional private funding is more likely to be on R&D of more immediate application and where more of the benefits can be captured on-farm. This view would appear to be shared by the PC in that they have written in a requirement for a balanced portfolio of higher-risk/basic vs. lower-risk/applied R&D as a requirement for public funding (P179). However this may not be sufficient to avoid an overall declining investment in the event of a reduction in the Government's co-contribution.

The PC pointed out that '*the Government might fail to invest in a project because it believes (erroneously) that the private sector would do so instead.* ***Generally, this is a worse outcome than funding research that would otherwise have proceeded***.' (P63, emphasis added).

Agriculture's human capability

The Commission's recommendation to reduce the public co-contribution by half is proposed to occur over 10 years in order to enable the culture of investment in agricultural R&D to adjust slowly. This would seem to be a reasonable compromise; however the immediate impact on the rural R&D system will be the symbolic and far-reaching message to young people considering agriculture as a career choice that it is of decreasing value to society and presents fewer career opportunities. A society's capacity to increase productivity is directly linked to the education of its members; the ongoing recruitment of the brightest minds into agriculture is central to Australia's ability to meet the emerging challenges of climate change, population growth and environmental sustainability[39]. Development of this human capacity has large spillover benefits to rural and regional communities.

An IMF study[40] on technology diffusion and multi-factor productivity in OECD countries from 1980 to 2003 suggested that *'domestic R&D may enhance technological transfer, by increasing domestic absorptive capacity, thus allowing countries to import and adapt to foreign innovations faster.'* The report also indicated that improved (or high skill) human capital created externalities both at industry and economy-wide levels that were economically significant: an increase in the share of high-skill workers leads to an increase in industry multifactor productivity growth by 0.5% per annum. One in eight Queenslanders are employed in agricultural jobs and for rural communities productive agriculture means more employment opportunities, new industries, potential population growth and a greater chance of continued service provision.

Structural limitations

[38] MLA submission to PC, 25 June 2010.

[39] Alston et al., 2009

[40] Tressel, 2008

However if we look at educational levels within agriculture there are some serious structural concerns. The PC has previously reported that the proportion of people working in agriculture with a degree was 7%, compared to 22% for the community as a whole. There are lower levels of other post-school qualifications within Australian agriculture as well[41], and a decreasing proportion of farmers under 35 years of age: from 12% in 2001 to 10% in 2006[42]. The number of graduates in agriculture is as much as 6-fold lower than needed[43], although some cross-disciplinary transfer of graduates will also occur, e.g. from veterinary to animal production fields. These figures point towards a restriction in the current and future human capacity of industry to substantially increase productivity, a situation that will be exacerbated by withdrawal of Government funding support.

The 2007 PC Report into Science and Innovation stated (P72) that *'..., a central government role involves removing the unnecessary regulatory burdens posed by government itself that can frustrate entry and exit, entrepreneurship, and innovation broadly. This role also includes building human capital and a broad research capability, where these are not likely to be developed by private agents.'* Given the figures reported above there is already a market failure to supply sufficient human capacity in agriculture, despite the current levels of public R&D funding.

The RDCs have programs aimed at improving human capability at both practical and scientific levels. For example, GRDC funds extensive programs aimed at improving industry capacity through technical workshops, 'train the trainer' courses and industry leadership development, including sponsoring The Australian Rural Leadership Program, and The Science and Innovation Awards for Young People in Agriculture. GRDC estimates the benefit: cost ratio over 30 years for these investments in capacity building to be 4.2:1. There are also RDC programs focused on building strategic R&D capacity. For example GRDC provides PhD scholarships, funding of strategic Professorial positions, conference sponsorships, and expertise development in areas of potential future skills shortage. MLA has development programs for early-career animal scientists that provide funding for supporting skills development and also fund Professorial positions.

A withdrawal of public funding support will likely compromise these programs, particularly the development of scientific capacity, as levy-payment decisions are made by individual producers to whom the benefits of developing human capacity at an industry level are less obvious. Research providers such as Universities commonly use RDC-funded projects to train younger researchers in a wide range of scientific skills. In funding these projects the RDCs have recognised the value of R&D skills development as a collateral outcome. The observed reduction in scientific expertise stems from the retirement of senior scientists and a deceasing pool of graduates to replace them[44]. Part of the recruitment problem is a lack of student stipends competitive with salaries in industry and other sectors of the economy. This is compounded by a lack of certainty in relation to longer-term operational funding and the availability of permanent positions; both of which are driven by short cycles of competitive project funding and likely exacerbated by a reduction in rural R&D funds.

[41] ACDA, 2009
[42] ABS, 2006
[43] ACDA, 2009
[44] ACDA, 2009

Relying on market forces to increase the number of scientists in agriculture is likely to be ineffective, given the long lag times between scientist training and subsequent R&D adoption. The lack of qualified and experienced people also acts as a disincentive to further private sector investment into R&D[45]. These factors should be considered further in the PC's final report.

Adaptation of overseas research

The PC in the draft report has highlighted (P47) that Australia commonly 'adapts' overseas R&D to local conditions and that this is an economically desirable position given the size of our market. The underlying assumption is that Australian agriculture has maintained the appropriate capacity to understand, adapt and apply the imported research. Australian agriculture cannot rely too heavily on importing overseas R&D without concurrently building the domestic scientific and practical capacity to effectively implement it. Given the market failure previously identified and the wider spillover benefits within the broader community this deserves appropriate public funding support.

Further, Australia has a unique production environment and will be at the forefront of climate change impacts, so there is a need to invest significantly in R&D that is tailored to our conditions. For example, GRDC (Submission to PC, P 30 of Appendix A) points out that local crop breeding is necessary rather than simply screening of overseas lines, taking 6 to 8 years after crossbreeding to obtain commercial quantities for growers, and up to 25 years including the pre-breeding technology discovery steps. This process requires consistent and reliable investment over the long term.

There is also reciprocity to international R&D knowledge exchange and collaborations. In addition to adapting other R&D, Australian scientists provide world-leading basic research with the resulting profile used to produce value-adding international collaborations. This is a key part of the mechanism by which R&D knowledge exchange becomes possible, particularly given the relatively small size of the Australian market. A system that encourages an overall contraction in rural R&D investment and an increase in private funding (with an associated IP focus, P124) is not conducive to the free exchange of information on which international scientific cooperation is built and, to the extent to which it is true, Australia's 'free-riding' on international progress. In terms of Australian national identity this is also not a good image to be cultivating.

Rural R&D investment to promote regional food security

Australia plays a significant role in encouraging food security within our region as part of a range of measures to promote regional stability, including the spillover of knowledge from R&D[46]. Growth in agriculture is up to 4 times more effective in reducing poverty in most developing countries than growth in other economic sectors[47]. Indeed Australia's Foreign Minister has recently announced $1.8 billion in funding to 2015 to promote food security as an initiative within our overseas development assistance aid programs, including enhancing assistance programs in agricultural productivity[48].

Australia plays a vital role in exporting rural R&D expertise to developing countries in our region and more broadly, including in market and value-chain development. While the PC rightly pointed out

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[45] Keogh and Potard, 2010

[46] Alston et al., 2009

[47] World Bank, 2008

[48] www.foreignminister.gov.au/speeches/2010/kr_sp_100922.html, accessed October 2010

(P49) that this is a role for AusAID and the Australian Centre for International Agricultural Research (ACIAR), it should be noted that ACIAR draws heavily on Australian researchers to provide the necessary experience and expertise to undertake this overseas aid work (ACIAR submission, P1,5). This expertise is often initially developed through researcher involvement in RDC-supported research projects within Australia.

Capacity building of these scientists to be available to work overseas will not result in a direct private benefit for levy-payers in Australia. Reductions in public co-investment for the RDCs may be a false economy requiring to be offset by greater capacity-building investments through the overseas aid programs; at least to the extent that this researcher training is supported by the current RDC system. This role of the public funding co-contribution into the RDCs in this regard should be acknowledged.

Summary

The requirement for long term investment in human capital, particularly given the long lags between investment and the peak of lifetime productivity of such researchers, is likely to see significant market failure or inefficiency without appropriate government co-investment. Even with significant RDC involvement in recruiting and developing human capital there is a current shortfall in available expertise. Individual primary producers or industries have limited private financial interest in paying for the maintenance of human capacity in rural R&D. The withdrawal of Australian Government funding will put further pressure on research providers, such as the CSIRO, State Governments and the Universities, to bear a larger proportion of the cost of maintaining such human capital and associated infrastructure.

Process of Public Funding Re-evaluation

Magnitude of public funding support for RDCs

The PC draft report proposes that the reduction in public funding support for industry RDCs commence at a set reduction of 0.025% every year for 10 years, until the contributions are equal to 0.25% of GVP of an industry. AgForce is strongly opposed to any reduction in the Australian Government's contribution or commitment to the current partnership.

The Commission has had to draw on largely qualitative evidence in its assessment of whether current levels of government support are reasonable and make some 'judgment calls' in this regard (P159). The Industry Commission Report in 1995 also recommended that it would be more appropriate for the Australian Government to provide co-investment on a $1 for $2 basis[49]; effectively the same recommendation if we set aside the question of cross-sectoral R&D. The PC has acknowledged the difficulty in identifying an appropriate level of public funding and the rationale behind selecting a 50% reduction in the Government's co-contribution is not clear.

To provide a better basis for recommendations about the appropriate quantum of public funding within the RDCs it would be preferable to include an assessment of the wider rural R&D investment system. This would include accounting for the National RD&E Framework process, the National Strategic Rural R&D Investment Plan (Rural R&D Council) and a DAFF review of total funding, relative

[49] Core, 2009

contributions, and the recipient programs within the wider rural R&D system (Rec. 5.2). This should also include data on private on-farm R&D expenditure that is not currently documented. Collection of this hard data will enable full use to be made of any available administrative savings and will allow more targeted reductions across the RDC model rather than a simple blanket drop in co-investment levels. A slower, more informed approach is preferable to running ahead of those processes with the significant risk of additional costs associated with 'overshooting' on reductions in public funding support (P130).

Methods to assess spillover benefits (e.g. ACIAR's impact assessment process) are still in their infancy in terms of their capacity to account for the multiple influences on adoption and provide robust causal attribution. The lack of an appropriate system for valuing broader community 'public good' outcomes from rural R&D is hampering efforts to properly evaluate returns on rural R&D. AgForce were encouraged to see that Draft Recommendation 8.5 included an examination by the RDCs of the scope to quantify these environmental and social impacts. This information would provide a more robust rationale for determining the appropriate level of public support and warrants further investigation. This approach appears consistent with Finding 10.13 of the PC 2007*, Public Support for Science and Innovation* Research Report – '*The extent to which public funding is reduced should be determined by an independent assessment of the induced spillovers associated with that support.'* Developing a robust mechanism for valuing spillovers such that these outcomes could potentially provide an additional income (e.g. ecosystem services) would also stimulate additional private R&D investment[50].

Public funding principles

The Commission suggests that appropriate levels of public support will emerge from an application of the 'public funding principles' to rural R&D policies and funding programs as set out in Draft Recommendation 5.1 (Page XXXV). AgForce agrees with the principle that Government funding should be aimed at enhancing productivity, competitiveness and social and environmental performance of the rural sector and the welfare of the wider community. We also support the efficient delivery and adoption of quality research, the promotion of program co-ordination, as well as transparency and accountability in regard to program outcomes through effective governance, and cost-effective evaluation and reporting requirements.

However AgForce would see the inclusion of the phrase '*by inducing socially valuable R&D that would not otherwise be undertaken'* as being too restrictive in not allowing for the spillover benefits that don't specifically include R&D, given production of positive externalities or reduction in negative externalities as reasonable justifications for public funding support[51]. Further, measuring R&D that would not otherwise be undertaken is difficult to measure or estimate accurately.

We also question whether public funding programs for rural R&D are the most appropriate mechanism for facilitating structural adjustment in the sector. This needs further explanation and justification. There seems to be some concern that public funding for rural R&D may somehow impede the process of adjustment of unsustainable businesses (P50) and act as an oblique support

[50] Frontier Economics, 2009

[51] Barnes, 2001

mechanism. Logic would suggest that increasing R&D intensity through public funding would not be likely to impede this structural adjustment process, rather speeding up the cycle of innovation and the resulting cost/price squeeze is likely to hasten the end of those more inefficient businesses.

Cross sectoral R&D delivery

The renewed focus by the Productivity Commission on cross-sectoral R&D issues is welcomed by AgForce particularly following the closure of Land and Water Australia (LWA), which was seen as a backward step in the promotion of sustainable land use. AgForce see the provision of R&D on environmental and other issues that cut across industry boundaries as essential to enable rural industries to respond holistically to the emerging global challenges to food production. Private and public good outcomes from rural R&D exist on a continuum, as the PC acknowledges (P40). It seems to be implicit in Figure 3.1 (P62) and elsewhere in the PC draft report that the private and public good outcomes of rural R&D are intended to be treated separately. This is likely to have adverse consequences and fail to deliver improved R&D outcomes.

In 2009, the total area of agricultural businesses (VAO ≥ $5,000) was 409 million ha or 53.2% of the total land area[52]. This highlights the importance that primary producers play in land management in Australia, and their role in implementing any findings to come out of R&D on cross-sectoral issues so that community benefits can be realised[53]. Indeed, in the case of LWA, the PC recognised (P142) that *'LWA's demise seemingly reflects the fact that its research portfolio was not tied to the needs of particular industries, meaning that there was no strong constituent base to defend it in the face of pressure to deliver budgetary savings.'* Further any structure to deliver cross-sectoral R&D needs strong links to, and the support of, primary producers for effectiveness as was found for LWA:

'Adoption of the knowledge produced from R&D investments for many of the investments analysed has been slow and only partial.... Where private benefits to land and water managers are apparent there is a tendency towards increased uptake of LWA-generated information, often with environmental spin-offs. Higher levels of adoption are achieved when higher profitability outcomes are targeted as suggested in (Pannell et al. 2006). The analyses justifies the efforts of research providers to engage with the research users through extension and participation– one of the characteristics of the RDC model and that of LWA's strategic intent.'[54]

The three RDCs of most interest to AgForce (MLA, GRDC and AWI) spent on average about 15% of their 2005 budgets on NRM-related R&D[55] and MLA spent about 23% of its 2008/09 budget on natural resource management, climate variability and biosecurity[56]. If industry RDCs retain ownership of the cross-sectoral R&D system there is considerable potential for better integration of the cross-sectoral findings into the broader package of production focused R&D findings. Most R&D undertaken by the industry RDCs already acknowledges the close integration of production with environmental and social outcomes[57], the so-called 'triple bottom line' approach. The delivery and

[52] ABS, 2010
[53] Williams and Price, 2010
[54] Pearson et al., 2010
[55] Day (2005), quoted in Williams and Price (2010)
[56] MLA submission to PC, 25 June 2010
[57] Williams and Price, 2010

uptake of R&D outcomes is maximised under the current model because the RDCs can use their broad and secure industry networks to drive on-farm practice change. There are already established credible extension mechanisms used by the RDCs for information dissemination and skills training, avoiding the need for a new RDC to establish those networks.

From the PC Draft Report (P84) - *'The Commission acknowledges that it is only relatively recently that the Government has been actively seeking to encourage the RDCs to invest in more broadly-based rural R&D. Research portfolios cannot be adjusted overnight and hence in the future it is possible that the government contribution will buy more additional, socially valuable, research.'* Addressing the PC's motivations for the establishment of a new cross-sectoral RDC: in considering the failure of the RDCs after a couple of decades of existence to appropriately collaborate on cross-sectoral issues, the failure of the Australian Government to clearly define its expectations in this area should also be acknowledged. Successful collaboration mechanisms between the RDCs are starting to emerge and, with an appropriate amount of time, RDCs will be able to adjust their portfolio balance so this can be achieved to an even greater extent. This collaborative process is preferable to other mechanisms such as the establishment of a new 'public good' RDC that is established on a theory of the separation of private and public good outcomes, and which would involve significant additional costs and administration duplication (e.g. 10-20% of total expenditure, Box 4.5, P77).

However a more formal mechanism is needed for oversight of these existing RDC collaborations, to ensure the work is adequately targeted, is national in scale and is not excessively dictated to by any one interest group, including levy-payers or environmental lobbyists. This needs further examination and consultation however existing bodies/processes which could be considered include RIRDC, The Council of Rural Research and Development Corporation Chairs, and the PISC National RDE Framework process.

Rural Research Australia as a Framework for cross-sectoral R&D

In terms of the proposed Rural Research Australia (RRA), there is a lack of detail around that body's governance arrangements, the process of R&D priority setting and how funding would be transferred with research responsibilities to RRA from other RDCs. The recommendation that RRA's funding appropriation come initially from the Government and with lower leveraging of industry funds (P164) as well as a desire to ensure that levy-payers do not unduly influence R&D direction (P139) point towards a potential separation of cross-sectoral R&D from landholders.

AgForce strongly supports the presence of industry bodies in the oversight of any such cross-sectoral body or mechanism, such as on board selection committees, and whatever the final governance configuration for cross-sectoral R&D that is introduced primary industry ownership of the process should not be compromised if the developed research is to be broadly adopted. Establishing a new RDC that is 'independent' of industry influence may also be incapable of influencing industry. Should a new RDC be formed it must be able to demonstrate that it has consulted with an appropriately wide range of industry and other stakeholder bodies.

Establishment of a new RDC as proposed would also involve significant additional administrative expenditure and the need to recreate communication networks with industry. Another consideration is the overlap between research providers who deliver on both industry-driven R&D and on cross-sectoral multi-disciplinary R&D programs. The provision that RRA can supplement its appropriation from other funding sources, including the RDCs, puts it in competition with industry-

focused R&D. Therefore a new RDC which has a budget independent of levy fluctuations will have greater potential to secure R&D expertise and this may set up a situation of inequitable competition with industry RDCs for shared scientific skills that are in short supply.

Attempting to separate the cross-sectoral R&D from the more production-focussed R&D (which currently usually includes these aspects) will be more expensive to administer, suffer from the lack of an integrated approach and potentially see a disconnection from landholders who are in the best position to implement cross-sectoral R&D findings. Significant cross-sectoral R&D is already underway within the RDCs, and with these outlined factors in mind, AgForce considers that cross-sectoral R&D delivery is better maintained within the current structure, but with appropriate co-ordination and Australian Government input.

Information request in relation to RRA in Draft Recommendation 7.1:

AgForce does not support this recommendation.

Areas for cross-sectoral R&D investment

Incentives for producer investment in public good environmental services are hampered by a lack of a suitable market for these goods and services[58]. This market failure influences producer decisions about R&D priorities for investment as well as for capital allocation and land-use decisions[59]. A mechanism for valuing ecosystem and other public benefit spillover services would produce the immediate market signal for encouraging producers to invest in environmental R&D. AgForce supports R&D into energy use efficiency (including cellulose-derived biofuels) and studies of other strategic inputs, such a phosphorus fertiliser, labour availability, transportation and biosecurity. Intellectual property as it applies to rural R&D and how it can be structured to promote continued R&D investment, while maintaining appropriate researcher access to the generated knowledge, would be an appropriate field of cross-sectoral study.

Principles guiding future operations of the RDCs

Administration and governance

AgForce is supportive of attempts to streamline and coordinate R&D delivery within the total framework to achieve better value for money, including the National Primary Industries RD&E Framework process, and a clearer documentation of funding flows. This process will potentially deliver significant cost savings and increased efficiency in R&D provision. These efforts at streamlining and reducing duplication should not act to reduce diversity, flexibility or competition (P112).

In order for the RDCs to work effectively the governing boards must have the appropriate skills base and experience that enable them to compete effectively in the global marketplace. Therefore it is imperative that directors are appointed based on their possession of skills that will benefit the industry; ideally each RDC would have a selection process that identified skills gaps and promoted

[58] Stoneham, 2009

[59] Williams and Price, 2010

appointment of suitably qualified directors to meet those needs. This process should also allow industry endorsement of identified candidates by levy payers. These appointment processes should be transparent and clearly and publically defined. These requirements would likely solve many of the RDC underperformance issues. Selection on the basis of skills and experience would reduce potential conflict of interest issues by board members and avoid the problem of a popular election process resulting in short-term or agri-political agendas being implemented.

AgForce thinks that the appointment of a voluntary government director may also contribute to improved RDC performance, and may improve co-ordination of efforts across the RDCs including on cross-sectoral issues. Selection of these Government directors should also be skills-based and include a requirement for the appointee to have recognised experience of the industries supported by the RDC. There should be the clear understanding that there will be no disadvantage for those RDCs who chose not to have a Government director, i.e. they will retain similar access to the Government and their choice will not affect co-investment oversight.

Information request in relation to Draft Recommendation 8.7: *The Commission seeks further input on what 'intermediate' sanctions could be used to address ongoing underperformance by an RDC prior to any withdrawal of public funding for the entity concerned.*

It is well understood that the ongoing underperformance of one RDC has caused the Government significant concern and is likely to have been the catalyst for a review of the RDC model. AgForce is concerned that for most of the RDCs the only sanction currently available to government is to withdraw funding. As this is not practical or in the long-term interests of the industry concerned, AgForce supports the introduction of sanctions on RDCs to manage underperformance. In particular, we support the sanctions placed upon AWI Ltd by government in the latest Statutory Funding Agreement. Of particular interest is the 'show cause' mechanism that requires AWI to account for its actions at the request of the Minister, with the Minister retaining the right to publish the response. It is vital that industry bodies be held accountable directly to the people who are the ultimate decision-makers on expenditure, governance and leadership of that company. AgForce supports the replication of the changes made to AWI's agreement across all RDC funding agreements as they are renegotiated. The governance principles outlined above are likely to solve most under-performance issues, where performance expectations are clearly defined and understood by the parties concerned and likewise any sanction process should be transparent, time-defined, clearly understood and accepted prior to implementation. Withdrawal of public co-contributions should only occur after all other avenues have been exhausted.

Information request in relation to Draft Recommendation 5.3*: The Commission seeks further input from participants on what precise form this new mechanism should take and what particular functional responsibilities should be encompassed within it.*

The voluntary appointment of an Australian Government director to the boards of the RDCs would assist in informing it of gaps or unnecessary overlaps in program coverage, help promote consistency in approaches across Government programs and evaluate effectiveness of overall Government funding support for rural R&D.

Research portfolio balance

AgForce supports the delivery of a balanced portfolio of short term, safe as well as longer term more risky investment, but this balance should not be restrictively prescribed by Government. This is in light of the acknowledged difficulty in picking research 'winners' and so should be decided by industry and the RDC with appropriate advice from experts in the research field. With any reduction in public funding support there is a net transfer of investment risk to primary producers and this should not be exacerbated by Government prescription.

The selection and evaluation process for potential RDC-funded projects should include appropriate scientific peer review. This will ensure that proposed projects are robustly designed and scientifically and statistically valid so that primary producers are applying the best knowledge possible and funds are not wasted on inferior work. Scientists regularly review scientific papers within short timeframes as part of their contribution to the scientific process, and this involvement would be seen as an extension of that contribution. This review process should be transparent and allow feedback to applicants on both accepted and rejected proposals, particularly so that younger scientists can learn from the experience and opinions of other researchers.

Communication and extension

AgForce supports timely adoption of R&D results, and effective communication between industry, researchers and government is vital to that process. As part of this it is expected that results be published both nationally and internationally as part of Australia's contribution to scientific progress and to facilitate access to information from overseas. This publication process should not be mandatory, given appropriate protection of IP such as that developed in donor company arrangements, but extension provisions should be routinely included in contractual arrangements between the RDCs and the R&D providers. Given the reduction in state government investment in extension capacity, the analysis and establishment of effective extension networks should remain a focus for RDCs and the Australian Government.

Evaluation

AgForce supports an evaluation and continuous improvement process but within cost efficiency boundaries. It should be recognised that non-adoption of R&D results by industry can represent a rational decision depending on prevailing market or seasonal conditions, labour limitations etc. Therefore R&D evaluations need to account for capacity/resilience building over the longer term and not be based solely on industry adoption rates within a short-term project cycle. Evaluation should be a component of a larger continuous improvement process, including both *ex ante* and *ex post* evaluations, and where the information gathered is used to improve subsequent outcomes and not just as a 'tick the box' exercise. The frequency of evaluation events should align as much as possible into existing RDC strategic cycles. Researchers should be able to maximise the time spent delivering R&D and so poorly directed, duplicated or under-utilised evaluation demands should be removed or minimised.

The draft report recommends 3 layers of mandatory performance evaluation. These processes should be streamlined to minimise the amount of funding (levy payer and Government) that is consumed by their administration. AgForce is supportive of achieving a transparent processes and value for money for co-investors, but the cost of this oversight should be in proportion to the value of the data gathered and its subsequent application.

Specific recommendations for levy arrangements

AgForce supports the providing of compulsory levies and matching government funding to industry-specific R&D organisations because it means the RDCs are accountable to government, Peak Councils and farmers such that this joint accountability heightens the need for RDCs to operate effectively and efficiently. The government contribution to RDCs provides a safety net that allows for continued innovation to occur in the event of a drop in industry levies.

Information request relating to Draft Recommendation 9.1*: The Commission seeks further input on whether R&D and marketing levies should be separate; or combined into a single industry levy, with some scope for a Rural RDC (see draft recommendation 8.3) to vary the allocation of funds between R&D and marketing without seeking the formal approval of levy payers.*

The collection of a single industry levy, as is the case with the wool levy, promotes the benefit of administrative simplicity which helps not only to streamline the collection process for government but also minimise the administrative burden on levy payers. The actual process for collecting levies is less important than the process for determining how these levies will be expended. AgForce considers it vital that RDCs seek the opinion of levy payers to determine both the amount of levy and the allocation of funds to marketing and R&D. A poll of levy payers is an effective way of seeking levy payers' opinions, as is the case with the three-yearly Wool Poll that determines both levy rate and allocation. It is also important that, once levy payers have determined the amount of funds to be dedicated to R&D and marketing portfolios, that each RDC be obliged to seek the relevant Peak Councils' approval for its Annual Operating Plan.

Conclusions

AgForce supports the current joint Australian Government-industry co-investment model for R&D funding where there is effective industry consultation and direction of R&D priorities and the inclusion of integrated extension programs to promote adoption of research findings. Given the significant challenges facing broadacre agriculture and the public benefits that accrue from rural R&D investment, an equal public and private sector commitment to agricultural innovation is vital.

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