Submission to the Productivity Commission Draft Report on Rural Research and Development Corporations

Government of South Australia

Prepared by PIRSA

November 2010

Summary

The South Australian Government wishes to make this submission which identifies some key issues relating to the Draft Report of the Productivity Commission (the Commission). The SA Government has a strong interest in this inquiry from both the perspective of a *funder* of research and development (R&D) and *provider* of R&D services and looks forward to further discussion and consultation with the Commission in Adelaide on 24 November 2010.

A number of agencies across SA government are involved in research, development and extension either directly or indirectly. In particular, the South Australian Research and Development Institute (SARDI) a division of Primary Industries and Resources South Australia (PIRSA), is the principal research and development organisation of the South Australian Government. In 2010-11 grants and subsidies sourced from Cooperative Research Centres and Rural Development Corporations (RDC) contributed $26 million to SARDI's $61 million research budget.

The efficient and effective *supply* of R&D lacks sufficient attention in the Commission's draft report. Key linkages between CSIRO, Universities, State research organisations and RDCs have provided critical foundations for the supply of core support functions to basic and applied research. In SA we have recognised these important linkages between the University and Government through the establishment of the Waite Research Institute.

The SA Government agrees with much of the content of the Draft Report. In particular, we agree with the enunciated rationales for government intervention in agricultural R&D, and the overarching conclusion that the current RDC framework (in broad terms) has been successful in delivering productivity gains for the target rural industries.

Industry focussed R&D is clearly one of the key factors underpinning productivity growth and consequently the overarching prosperity of Australia's rural industries. Noting also that the significant amounts of physical and human capital currently deployed to rural R&D may be difficult to replace if lost to these purposes. Significant uncertainty regarding the likely success of reforms in this area exists, and care therefore needs to be taken to ensure that we do not throw the productivity "baby" out with any industry subsidy "bathwater".

The SA Government also acknowledges the merits of potential public funding and intervention on the basis of additional benefits, including "broader community spillovers" and the pursuit of "other government policy objectives".

Any reforms should be focussed and monitored closely against both their intended purpose and any costly unintended consequences, and build in flexibility for additional change in the policy and institutional environment in light of future learning.

In presenting this submission the SA Government has developed a schematic (see Diagram 1) depicting our current understanding of the implications of the Commission's proposed recommendations to help highlight and inform our response.

If the overall objective is to improve economic efficiency, then the Commission's proposed recommendations focus government intervention and associated institutions on four specific market failure or policy objective areas associated with R&D:

- Intra industry spillovers;
- Inter industry spillovers;
- Broader community spillovers; and
- Government intervention to support other policy objectives (or "Government research support for its own activities").

It is with this structured pursuit of industry productivity and broader community outcomes in mind that the SA Government's concerns can be summarised as:

- The proposed reduction on public funding of industry focussed R&D may have significant adverse impacts on industry productivity – for example, because industry hasn't recognised the value of or been able to organise agreement for increased industry funding. The proposed 10 year, fixed transition does not accommodate addressing these risks. Consequently, the South Australian Government does not agree with the recommendation that funding of R&D through the RDC should be reduced. This potential occurrence and any commensurate impacts warrant further attention by the Commission;
- The SA Government proposes a five year review of the proposed move to increase the share of existing public funds allocated to inter industry and broader community spillovers before any decision is made to reduce aggregate public funding of rural R&D;
- Greater clarity is required on the specific institutional roles and then associated governance arrangements of Rural Research Australia (RRA), other government agencies (Commonwealth and State) and RDCs in addressing inter industry spillovers, broader community spillovers and issues such as potential synergies and duplication in regard to other government policy objectives; and
- The recommendations should address strategic oversight and coordination, including the potential roles of the National Primary Industries RD&E Framework and National Strategic Rural R&D Investment Plan in contributing to the efficient and effective functioning of the RDC model going forward.

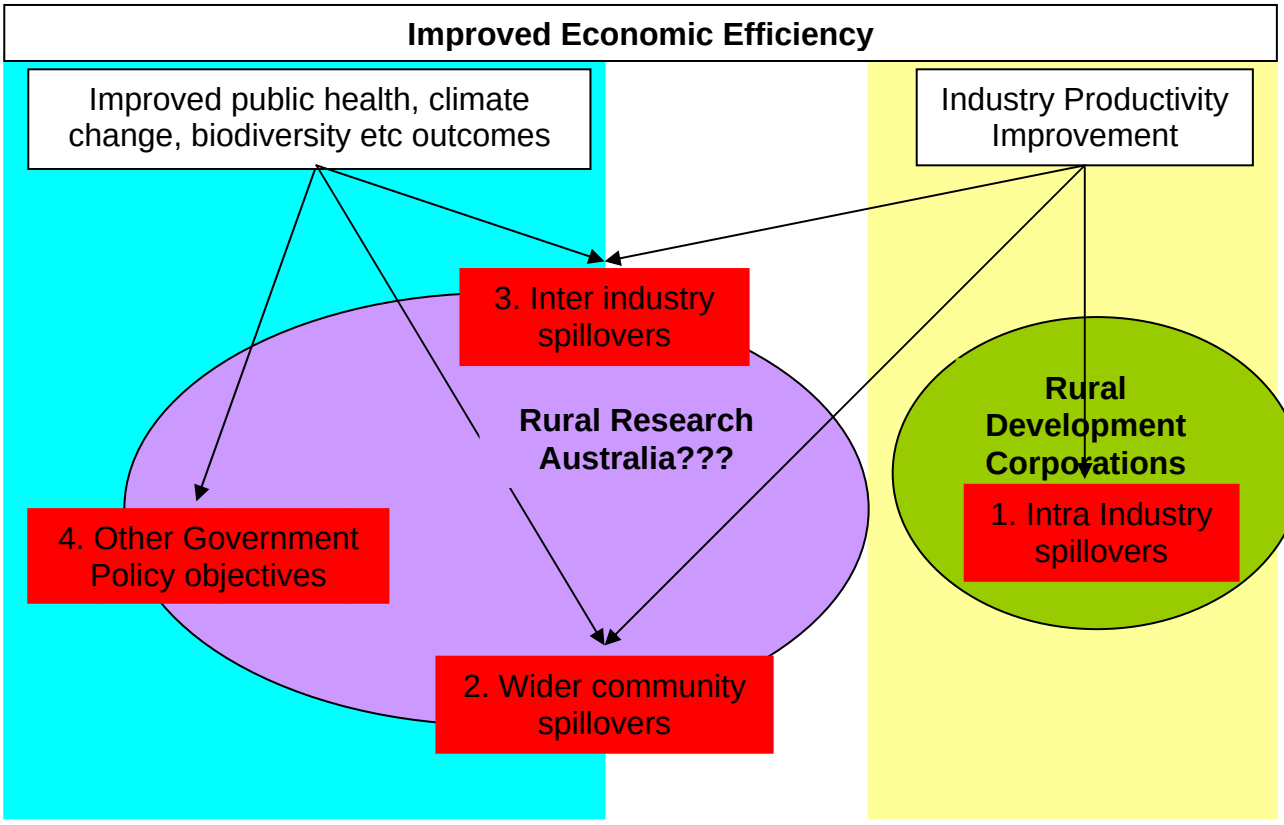
The following submission provides further detail against each of the recommendations made by the Commission.

Recommendations 6.1 and 7.1: Changes to the configuration of, and funding for, the RDC model

The SA Government believes there is an important role for Government in R&D and, as highlighted in Diagram 1 in red, the areas of market failure (as described by the Commission) include:

1. Intra industry spillovers – benefits of R&D accruing to producers within an RDC defined industry;
2. Wider community spillovers – R&D contributing to improvements in broader benefits such as public health or to the environment;
3. Inter industry spillovers – benefits of R&D outcomes accruing to producers or businesses across RDC defined industries; and
4. Other government policy objectives – R&D outcomes used to support other policy objectives such as climate change, fisheries management or biosecurity.

DIAGRAM 1: Structuring Research and Development in Australia



The disincentive for the rural sector to privately invest in R&D is well recognised and the SA Government believes that the institutional arrangements supporting the RDCs through levies (highlighted yellow) addresses this market failure. The current RDC model is a useful vehicle for planning, funding and delivering R&D – and in particular providing important linkages between industry demand and research supply.

It is acknowledged that the R&D agenda requires a structure and process to ensure an appropriate balance of:

- Tactical research addressing short term immediate needs seeking a ready solution of direct relevance to industry; and
- Strategic longer term, multi-disciplinary research developing and prototyping outcomes with less obvious immediate results.

Industry investors naturally favour the tactical research pathway, it is the SA Government's view that the current RDC model, funded by both government and industry has been instrumental in assuring that the strategic long term view has also been addressed.

The benefits of improved governance for some RDCs to improve their performance against an own industry productivity objective is acknowledged by the SA Government. However, as stated earlier, the SA Government is concerned that with reduced public funding for intra industry focussed research, that aggregate funding may also fall – and with potentially adverse impacts. For example, industry coordinated RDCs may not have the foresight, capabilities or information sets to convince their producers to invest in what is expected to be worthwhile research for them. There are examples of Australian government withdrawing investment to a particular sector/discipline which has not resulted in private investment and consequently has seen the skills base in Australia eroded (eg weed, pasture and forage, soil research). Box 1 provides an example using the history of pasture R&D in Australia.

Whether this is a case of crowding out of private investment or rather a case of high transaction costs and low incentives is unclear, but even assuming that a contraction in aggregate industry based research is warranted from a benefit cost perspective by industry, any potential contraction and the impacts on industry warrant public monitoring. The Commission should also be transparent in its Final Report with any views on potential changes to aggregate industry based research that may be expected from any proposed reduction in funding.

The SA Government seeks further clarification of the proposed role of the RRA and any other models or institutional arrangements to address the remaining key rationales – inter industry spillovers, wider community spillovers and any coordination in the pursuit of other government policy objectives.

Many inter industry spillovers may be best addressed through the collaboration of two or more RDCs. Transaction costs and potential gaming or attempted free riding by particular RDCs may warrant additional government intervention. A light handed introductory or suasion approach by RRA, RDCs and other potential users or beneficiaries of inter industry spillover related R&D appears to be a first best strategy – if effective. The potential use of public funding to encourage involvement should be retained as a potential instrument for inter industry spillover related R&D.

The SA Government places a strong importance on ensuring crosscutting issues such as climate change, biodiversity and water security are addressed. These issues are not always directly aligned with a particular beneficiary sector and often require a complex multi-disciplinary, multi sector approach. By way of example, the State Government has

provided $25 million over five years to the newly established Goyder Institute, to be matched in kind by the CSIRO, the University of South Australia, the University of Adelaide and Flinders University. The institute will provide independent scientific advice on SA's water system, improving the State Government's ability to forecast threats to water security and develop an integrated approach to water management.

The Draft Report suggests RRA could focus on water, land and energy related issues. If RRA were to contribute to improved public outcomes in these areas, a more defined set of policy objectives for RRA is warranted. The potential for duplication (eg in land, water or energy related research with the climate change or water policy focussed departments) is not immaterial. As such connection of R&D priorities with the activities and objectives of Government departments dedicated to these public policy issues (for example Murray Darling Basin Authority, Department for Climate Change) is strongly encouraged.

While potentially outside the scope of this review, and not currently depicted in Diagram 1 above, the interaction between the RRA and privately funded R&D and other State and Commonwealth agencies and processes that also contribute to the management of these policy areas are of significant importance. These roles should be clarified and issues resolved before any major decisions to change the current structure.

In addition, R&D acts as an important input defining necessary government intervention and outcomes assisting in improving the performance of government services responsible for addressing potential externalities. Examples include: Hazard Analysis Critical Control Point programs for food processing; input and output controls for marine fishing; testing and monitoring during stages of food production and processing; operating and enforcing compliance of quantities of fish caught; the monitoring of fish stock levels; and education programs (e.g., food preparation for food handlers and households). The Commission recognised in its 2007 report[1] the significant contribution of publicly funded R&D to innovation within functions of the Government itself, thus improving the productivity of its services and benefiting the community as a whole. SA Government believes the Commission's current report does not provide a strong enough emphasis on this function of R&D.

See Box 2 for an estimate of the social benefits derived from the publicly funded Food Safety and Innovation research programs in SARDI.

While the SA Government largely agrees with the Commission's assessment of value chain, this is not to say that a value chain approach in investigating potential market failures and associated government interventions is not warranted. For example, food safety incidences can occur anywhere from the *paddock to plate,* so a value chain approach to manage externalities can often be an effective and more thorough approach to assessing a problem.

Recommendation 5.1: Public funding principles

The SA Government agrees that an overarching set of public funding principles covering: the basis for government to contribute to the cost of rural R&D; the relationship with other

[1] Productivity Commission, 2007, *Public Support for Science and Innovation*

policy levers; and good program design features, is essential for ensuring that R&D into the future is efficient and effective.

However, the relationship with other policy levers should also include recognition that public funding of R&D and compulsory levies are not the only policy levers available to Government for addressing the market failure associated with the potential under investment in R&D. A successful example includes the introduction of the Wheat Breeders Act in 1994 which enabled breeding programs to generate financial returns for new varieties through royalties (End Point Royalty) collected on the production of a tonne of grain. The establishment of property rights enabled and resulted in wheat breeding becoming a successful commercial activity.

Future arrangements should be flexible enough to accommodate changing market conditions and technological discoveries that may enable increased use of instruments such as Intellectual Property rights to facilitate rural R&D.

Recommendation 8.1: Principles to guide the future operation of the RDC program

Best strategies are clear about objectives, relative priorities and trade-offs so that tangible outcomes can be achieved. It is strongly recommended that the principles be underpinned by an evidenced approach. The robustness of any proposed expenditure can then be assessed against different possible futures and risks and uncertainties can be identified and potentially managed.

Recommendations 8.2, 8.3, 8.4, 8.5, 8.6 and 8.7: Specific changes to help give effect to those principles

SA agrees that intervention by Government be justified by the existence of spillovers. However, spillovers can often be a *surprise* and unpredictable outcome of what may initially be classified as industry R&D. It is often Government's involvement in the process (not necessarily financial) that allows for the identification of the inter industry spillover. For example, an initial piece of research to boost productivity in grains has been adapted to address productivity limitations for potato production (soil-borne disease testing) and aquaculture production (identification of marine pests), thereby contributing to the environmental sustainability of aquaculture. See Box 3 for further details.

SA Government therefore supports close interaction between industry productivity focussed RDCs and RRA and/or other Government institutions focussed on capturing inter industry or wider community spillovers.

Recommendations 5.2 and 5.3: Framework data collection and program coordination

SA Government agrees that improved data collection (especially tracking of the private sector's contribution) will assist decision making and prioritisation. The SA Government is currently developing mechanisms to better track and coordinate its own R&D expenditure and both these recommendations will provide valuable information to assist with this process.

Recommendations 9.1, 9.2, 9.3 and 9.4: Levy arrangements

South Australia believes Governments do have an overarching role in ensuring each RDC has sufficient funds to invest in an adequate level of both tactical and strategic R&D for their industry. In cases where the funds are insufficient, Government needs to work with the RDC in developing a way of adjusting levy arrangements, either through legislation or other methods.

Recommendation 9.5: Further review

While the SA Government recognises that the changes proposed by the Commission have some merit, large fixed costs and the long term nature of R&D suggests that some caution is required before significant changes are made to a relatively well functioning RDC model.

Given the potential scale of changes, including around a $100m withdrawal of public funding for industry based research and a potential increase (or recovery) in land, water and energy related research of around half that, then waiting ten years to review and potentially amend arrangements appears too lengthy a delay and too rigid a pathway. If the recommended funding and structural changes are implemented, after five years appears a more appropriate time to schedule a periodic review. The proposed potential funding of RRA will have been reached, and by which time any significant trends in industry behaviour or other public priorities will have emerged.

The SA Government is concerned that the impact in the reduction in funding could be difficult to assess when combined with the significant structural changes proposed. From first principles the SA Government understands the Commission's assumption that the withdrawal of public funds, from what is essentially industry focussed R&D, is expected to be replaced by industry funding to the extent that it is considered beneficial to do so. However, history demonstrates that this is a naive assumption, the lack of funding for weeds and pasture research and development in Australia is testament to this approach, and the withdrawal of government funding did not eventuate in industry picking up the ticket. The South Australian government strongly recommends careful evaluation and monitoring of this *key* assumption.

A five year review of the change in structural arrangements only and assessing appropriate levels of funding following the review is preferred by SA. Making conclusions on optimal levels of R&D may be intractable and so setting public levels of investment from this approach is likely to be very difficult/impossible. Setting up good/improved R&D models to address identified market failures is likely to be a more productive approach, where those most informed on the marginal returns to additional investment (and so the optimal level of investment) are able to influence those decisions.

Given also the significant uncertainty of impacts and the potential for learning on how to better manage the range of spillovers at play here, there should also be a clear trigger and Commonwealth leadership accountability regarding taking policy action if major unintended consequences emerge at any time going forward.

BOX 1: Funding for Pasture R & D

A pasture is a forage plant used for livestock production and nitrogen inputs (in the case of legume pastures) into a cropping phase. Research and development investment into pastures is often a low priority because it is not a direct commodity and pastures benefit both grazing industries and broadacre cropping enterprises, the latter via rotational benefits.

In the 1990's there was large investment from GRDC, AWI, MLA and Dairy Australia for pasture research. By the end of the 1990's, AWI largely removed funding for research, and prioritised marketing wool as a natural fibre product. Whilst funding from MLA is ongoing, they have focused on animal production and basic research into molecular biology. Dairy Australia now has a small research budget with a narrow focus.

Between 2000 and 2006 GRDC largely supported pasture breeding and agronomy R&D in Australia. GRDC then made a strategic decision to cut funding to pastures and focus directly on grains.

In 2006 Pastures Australia (PA) was created, a partnership of MLA, GRDC and AWI. A small research portfolio of <$1M per annum was set aside to fund pasture research in Australia. However, AWI decide to leave PA shortly after joining. PA is now finalising its first 3 year round of investment but has no funding to continue. PA is seen as a failure because it never attracts reasonable levels of financial support or confidence from the funding bodies and had high administration costs. RIRDC have now been appointed to manage PA.

MLA supports the concept of PA and wants to maintain its name but change its structure. MLA are currently reviewing their investment into the 'feed base'.

RIRDC have funded pasture small R&D projects for new products or issues that affect the seed and fodder production industries. There has also been a series of pasture projects in discrete areas funded through the Future Farm Industries CRC.

Too often the responsibility for funding a significant level of research in pastures has been hand-balled between the major RIRC's. As a result Australia's future capacity to conduct pasture research is greatly diminished.

- The Pasture Genetic Resource Centres are being mothballed around Australia, with the tropical centre in Biloela closed, and the temperate centres in Adelaide and Perth mothballed. Australia is not full-filling its international obligations to maintain these collections and make them available, and is turning a blind eye to their importance in responding to future threats in Australian agriculture.
- In the last 5 years direct research investment from GRDC, MLA and AWI into pasture breeding has stopped (lucerne, medics, sub-clover, ryegrass). Pasture breeding programs are now trying (and failing) to fund activities from commercial alliances and royalty returns. Whilst commercial investment should be encouraged these sectors are not large enough to provide a complete investment solution.
- Pasture agronomy and management programs to improve the efficiency of livestock production have largely been neglected.

BOX 2: Food Safety and Innovation

Food Safety & Innovation programs provide social benefits through inputs into both government intervention and policy development to maintain and improve public health outcomes. To inform on these social benefits, PIRSA consulted expert SARDI scientists and where possible reductions in the percentage of cases of Salmonella and Campylobacter that might occur due to specific SARDI research projects targeting poultry and egg safety were estimated.

These anticipated reductions were compared to the number of cases that would have occurred anyway. The difference between these two scenarios represents the possible avoided cases of Salmonella and Campylobacter due to the research. To convert these avoided cases into an estimate of avoided cost to the Australian economy the difference in reduction between cases with and without SARDI research is multiplied by an estimated cost of disease per case per year, and is discounted back to present day values.

Using various authors' estimates of cost per case, calculations of the gross benefits to Australia are:

- $46 million using $630 per case for both Salmonella and Campylobacter (FSANZ 1998 and Allens Consulting Group 2002);
- $104 million using $2,740 per case of Salmonella and $964 per case of Campylobacter (Minter Ellison 2002); and
- $93 million using $2,475 per case of Salmonella and $847 per case of Campylobacter (the United States Department of Agriculture's Economic Research Service as cited by Allens Consulting Group 2002).

It should also be noted that many cases of foodborne disease are not reported and hence does not show up in surveillance statistics. As reported by the OzFoodNet Working Group in a report forming part of the Commonwealth's 2006 quarterly report on Communicable Disease Intelligence; "In Australia, for every notification of Salmonella and Campylobacter there are approximately 6.9 (95% credible interval 4.0-16.4) and 9.6 (95% credible interval 6.2-22.4) cases in the community respectively" (OzFoodNet Working Group, 2006, p.278).

BOX 3: DNA Testing of Soil for Grains Industry

A test developed by the Cooperative Research Centre for the Sustainable Aquaculture of Finfish (Aquafin CRC) with funding from the Fisheries Research and Development Corporation, can now more quickly, simply and cost effectively detect whether the marine environment used for tuna aquaculture is healthy and sustainable.

The test has the potential to save months of time and consequently, thousands of dollars a year in preparing the environmental monitoring assessment reports required by tuna farmers as a license condition by the South Australian Government environmental regulators.

The system identifies the quantity of nine groups of small marine organisms that are important indicators of organic enrichment in sediments, by determining the amount of DNA present for each group of organisms. The test then compares the results obtained from sites near farms (compliance sites) and from sites distant from farms.

The method was adapted from a testing technique for soil borne plant diseases by the South Australian Research and Development Institute (SARDI Aquatic Sciences and Field Crops Pathology, in collaboration with CSIRO). The original intent of this work which was funded by SARDI and SAGIT (SA Grains Industry Trust, was to develop a method to predict risk of soil-borne disease prior to sowing a grain crop). The method of processing samples had to be significantly modified to work with marine sediments, and an extensive program was undertaken to sequence key marine sedimentary animals and to design DNA probes with the requisite specificity.

The test results from the monitoring programs are presented in a newly developed and easy to read format, through an Environmental Compliance Scorecard (ECS), a methodology considered equivalent to world's best practice. The ECS provides a neat analysis of the DNA data by evaluating a series of pre-determined indices of environmental status. These results are integrated to produce an overall compliance score that is ranked on a scale of 0 (very poor) to 100 (perfect result), which is then displayed as one of three categories: green indicating all is well; orange, indicating the situation needs watching and red, indicating there is an issue, which needs addressing.

These categories, matching the colours on a traffic light, provide a very simple message to industry and government environmental managers.