SUBMISSION TO THE PRODUCTIVITY COMMISSION INQUIRY INTO THE AUSTRALIAN GOVERNMENT RESEARCH AND DEVELOPMENT CORPORATIONS MODEL©

June 2010

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The Productivity Commission Issues Paper raises many issues in relation to Rural R&D Corporations. This submission specifically addresses ***"the scope for improvements to the current model and any alternative models that could deliver better outcomes"*** *(Commission issues paper p1)*[i]*. There are brief comments on governance, finance, administration, programme management and Intellectual Property. These may be examined in more depth at public hearing if desired.*

The author was the inaugural Executive Director and Chief Executive of the Grains Research and Development Corporation, GRDC, (1991-1994) and subsequently CEO of the Australian Mineral Industries Research Association, (1994-2004), which became AMIRA International in 1998. From 1993-1998 AMIRA also administered the Australian Coal Association Research Programme (ACARP). Consequently this submission reflects the experience of one who has administered all three Australian collaborative commodity research models, as well as having served on various Cooperative Research Centre and other collaborative research committees.

Conclusions and Recommendations

Rural Research and Development Corporations would benefit from cross fertilisation with private sector practice in the minerals and coal industries, specifically AMIRA International and the Australian Coal Association Research Programme. The models have many similarities and some critical differences. However, there are valuable insights to be gained from cross fertilisation between sectors. Many of the questions posed by the Commission Inquiry become irrelevant if RDCs were to adopt some of the principles and practices of the AMIRA and ACARP models.

1. **The larger RDCs should become self sufficient with government funding reducing to zero, whilst levies continue to be collected by government under contract. Levy payers should be eligible for Research and Development tax credits.**

2. **Federal funding for major 'public good' projects should be contestable under tender to competing research organisations including the RDCs, CRCs and other research centres.**

3. **RDCs should more aggressively pursue contestability in disbursing levy funds and should not refrain from using their market power in directing the output of marginally funded projects with public sector research organisations.**

4. **RDCs should also investigate the possibility of more innovative options, 'Transformational Alliances' or other international models in research funding.**

5. **Intellectual Property concerns should not be a prime driver in collaborative research projects. The emphasis should be on the ability to disseminate the knowledge widely.**

The RDC Model

The Commission issues paper overviews the current status of the Rural R&D Corporations and this submission will take that as read. My understanding of the intention of the RDC model(s) under the original 1989 PIERD Act[ii] is that, underpinning the strategic planning and administrative functions outlined in section 11 of the Act, there were two critical principles:

1. To shift the drivers from research supply to market demand by emphasizing industry control. As a result, the concept of contestability in funding projects gained momentum.
2. Separating R&D from marketing and political imperatives recognised that R&D operates on a longer time horizon with different drivers.

The GRDC still reflects the original intention of the Act, essentially investing levies collected from a large number of growers and 'matching' government funds. Growers are represented by their designated representative organisations under section 7 of the Act. In 2008-2009 the GRDC levy was $89.21 million with Government funding of $43.90 million and total expenditure of $121.27 million. This compares with a total expenditure of about $36 million in 1991, about a 60% increase over inflation during that period. Research investment in 2010-11 is estimated at $133.2 million. About half is offered by a tender process[iii].

Performance monitoring of a large number of projects and programmes is by committee and special review. The committee system consists of technically minded farmers, researchers and other appropriate members.

Other 'Industry Owned Corporations' have diverted from this model and appear to have diluted one of the original strengths of having an organisation solely focussed on R&D. However, the GRDC is still regarded favorably by many although it is not without criticism. However, after twenty years operation, reappraisal and renewal is not inappropriate.

The ACARP Model

ACARP is also an 'investment' model managed by Australian Coal Research Limited (ACRL) on behalf of the Australian black coal industry. ACRL is a Registered Research Agency for tax concession purposes. ACRL sub-contracts Australian Research Administration to administer the program. Otherwise the industry committee system and administration is similar to the GRDC model.

ACRL collects a 5cents/tonne levy on the industry which enables expenditure of $12-15 million on R&D programs each year. (An initial transitional arrangement was for the Government Levies Revenue Service to collect the levy and be paid for this service). There is no government contribution. The levy is voluntary, however, the Coal Levy Act 1977 was suspended to allow ACARP to come into being. If not all producers participate, the Government can reinstate the Act. Black coal producers qualify for the 125% R&D tax concession (=Tax Credit). This is currently under review by The Treasury in second draft legislation.

ACRL sought clarification of definitional issues, identification of so called 'core' and 'supporting' R&D to avoid identification of every single activity (~1500 activities). ACRL had to apply for 'Class Ruling' under the tax credit system. They are anticipating a simplified system.

The researchers retain the IP and administer it but return a royalty stream to ACRL when appropriate.

The AMIRA Model

The RDC and ACARP 'investment' models disburse funds which are collected under regulatory legislation, essentially 'picking project winners' on behalf of their constituencies. Both have enjoyed considerable success.

The AMIRA model goes one step further. AMIRA is a 'research broker'. Each individual project is negotiated and funded independently by several member companies. Only when the required number of companies have 'signed up' can the project proceed. This process is by far the most taxing and risky part of the process and can take time. However, once committed, companies are much more likely to implement the results[iv].

This is a significant difference between AMIRA as a 'research broker' and the RDCs and ACARP as 'research investors'.

Once committed, AMIRA members then provide a monitoring committee, administered by AMIRA project managers, which oversees the project.

AMIRA currently has about 34 projects investing $80 million of industry funds. New projects raise between $10-20 million industry funds each year. It is worth noting that industry partners contribute 10-20% to AMIRA to cover administration costs, a sum which is in addition to the research project investment.

Whilst AMIRA has always had major support from the 'big' Australian companies, it also drew its strength from the mid-cap and smaller companies with limited in-house research capacity. Many of these companies have gone in the spate of recent merger and acquisition activity. Additional funding from these mid-cap and smaller companies has often been critical in achieving the necessary minimum funding to start projects. In other words even with support from the majors, AMIRA still needed the smaller players to complete project funding.

With globalisation of the industry, this problem has been overcome as AMIRA became 'AMIRA International' and now has the support of all global mining houses. However, the bulk of research work is conducted in Australia, given the outstanding 'world best practice' quality of Australian minerals research.

(Whilst RDCs focus predominately on Australian problems, there is still considerable international cooperation and exchange for example the international treaty on plant genetic resources for food and agriculture).
AMIRA also gets suppliers to the minerals industries involved in projects. This not only provides valuable input, but also provides an additional route to market for any commercial products and services.

As AMIRA recently celebrated its fiftieth anniversary, its continued success recommends analysis of its strengths as a potential model for other sectors.

The Cooperative Research Center Model
CRCs were introduced in parallel with the RDCs and have been assessed and reorganised considerably since. This paper will not re-visit this debate. However they do present an important and credible alternative for disbursing public funding to agriculture. Having been involved as an assessor in several CRC Rounds, including the last one, the process has been considerably improved. There are however three issues to address if they are to be serious competitors to RDCs for large program funding:

1. Successful CRCs should be allowed to continue with existing programs which have proved their worth.
2. All research programs should be thoroughly assessed. At present only one self selected program is properly evaluated, an outrageous situation.
3. There should be provision for a smaller number of partners if required, reluctant or unwieldy partnerships don't work.

Governance
AMIRA and ACARP are both independent of the Minerals Council of Australia, State Mining and Minerals Associations and equivalent industry organisations elsewhere. (AMIRA International, incidentally, attracts more mineral company membership than the Minerals Council).

Thus both AMIRA and ACARP exemplify the two basic principles of separating supply from demand and R&D administration from commercial and political imperatives.

This contrasts with what appears to be *"Blurred boundaries with Independently Owned Companies model",* identified in the issues paper (P18).
The industry philosophy towards AMIRA has always been clear: No government, researcher, political or marketing involvement in the Association. The Board and project management is by industry professionals.

The RDCs have always been subjected to heavy agripolitical pressure, particularly in the maintenance of public funding. Whether the benefits from this trickle through to the rest of community is open to question.

Finance
The Commission poses the questions (P19): "*To what extent would governance be simplified if the Government's contribution was separately managed, leaving the RDCs to manage contributions from levy payers? Do the benefits for RDCs and levy payers that come with the government contribution outweigh the costs of the more complex governance regime and, in particular, the constraints on the way in which funds can be spent?"* and more bluntly (P16) *"why is a significant public contribution justified?".*

Another significant difference, this time between AMIRA and ACARP and the RDCs, is that relevant mineral companies number one hundred or so whilst growers and primary producers are in the tens of thousands. This is usually offered as a critical difference between the agricultural and mineral commodity industries, although shareholders in mining and mineral equities are also numbered in the thousands. Growers and primary producers are however represented by a much smaller, and more manageable, number of State and Federal organisations: far fewer in fact than the number of mining and minerals companies. This considerably dilutes the argument that RDCs have to deal with 'thousands' of individuals in establishing levy conditions. It is acknowledged that these agripolitical organisations are subject to unrelated destabilising political activity. This can

be overcome by modelling the 'representative organisation' under the Act on Australian Coal Research Limited.

The mineral industries have always, with great success, subscribed to the view that the costs of government involvement outweigh any perceived benefits.
The ACARP model suggests that there is no reason at all why the larger RDCs should not become independent of government. The levy could continue to be collected by the Federal Government Levies revenue Service on the advice of the representative organisations.

Agripoliticians advance three arguments against this view:

1. 'Market Failure'
2. Grower resistance to losing a public benefit (usually couched in terms of declining 'National' benefit through agricultural R&D) and
3. The view that government funding 'holds the system together'.

The 'market failure' argument in agriculture, that there are 'spillovers' which cannot be captured by those funding the research, has been well articulated in the past[v] and remains valid now[vi]. The issue however is whether the Rural R&D Corporation model is best equipped to address it in its present form. If RDCs were to become self-sufficient without direct government funding, then growers and producers would have to become eligible for a tax credit on levies paid. This is eminently reasonable as the major 'market failure spillovers' in the National priorities promoted by the Federal Government, such as Climate Change, Water and Biosecurity, benefit the whole Australian public not just primary producers, and thus would not constitute 'double dipping' if levy payers receive a tax credit.

This argument assumes that public moneys would not be directed away from agriculture, but would be disbursed in a different way. It is acknowledged that Treasury will claw back funding when it can, but then it is up to Agriculture to justify its case for continued funding.

The Commission has postulated (p13) whether '*some form of contestable grants system*' for the public funding component might be appropriate. Why not? Most 'public good' issues are much bigger than a single industry and could be addressed across the board by public tender. There are now more methods of funding collaborative research through different organisations than when the Rural R&D Corporations model was created. For example, Cooperative Research Centres, Key Research Centers and the NZ Crown Institutes amongst others could all compete for tendered research.

The evidence that the RDCs have exercised contestability of the public funding component effectively is itself contestable. Whilst GRDC invests half of it funds in tendered research, it still leaves $60-70 million that is not. There is no reason why public funds should not be open to tender by competing RDCs and research organizations.

Grower resistance to losing a public benefit would be ameliorated by payment of a tax credit, which is immediately tangible, overcoming to some extent the concern of producers who profess not to see any benefit in levy funded R&D.

The whole question of contestability is in any case a limited debate. In addition to Australian CRCs, there are other international examples of industry moving selectively

towards more strategic research alliances with outstanding research institutions which transcend individual project or program funding which could be investigated as models. One such example is the Nexia Solutions Ltd (formerly British Nuclear Fuels) relationship with various universities in the UK, established to address decades of under investment in the nuclear sciences [vii]. Characteristics of such alliances are long term strategic goals centred around research ranging from incremental to radical. An overarching umbrella agreement enables research to develop seamlessly in a more mature partnership. Partners may involve researchers, producers, government agencies. Whilst elements of this approach are encompassed in RDC and CRC programs, the emphasis is on an 'overarching' rather than individual project and program contracts, with a rolling 5 year horizon. As there are those who maintain that agriculture is in Australia is entering a similar phase of under-investment as the UK nuclear industry,[viii] this model and other international endeavours like it should at least be considered.

Also, it is far from the case that 'spillovers' are peculiar to agriculture, as is often assumed. Collaborative research funded by the mineral industries has positive social and industrial benefits in very many other areas ranging from environment to aerospace[ix].

Agripoliticians are adamant that government funding 'holds the system together'. Whilst this is undoubtedly true for the smaller RDCs, there is little to support this view for the larger ones. The alternative has never been tried. Surely GRDC with $80 million or so a year of growers' funds to invest can stand on its own two feet? With no direct government funding, growers would express even greater interest in how their funds are spent, particularly with the direct benefit of an annual tax credit.

If the Federal Government still played a key role in collecting the levy under legislation, on advice from representative organisations, it would continue to 'hold the system together'.

Administration

Administration costs of 10-20% (P20) are in line with similar costs for AMIRA and ACARP. AMIRA project managers spend about half their time raising funding for each individual project. This is by far a more demanding process than disbursing funds collected by levy. It does however emphasise where market priorities lie and helps ensure better outcomes for the industry.

Debate on administration costs is a continuing 'furphy', 10-20% is reasonable to ensure implementation of the output of quality research and delivery of outcomes. Spending more on R&D that is poorly administered is neither efficient nor effective.

This is not to say that there are no efficiencies to be gained. Whilst benefit:cost analysis tends to give high returns on individual projects (depending on assumptions) broad estimates of overall b:c appear to be in the range of 2:1[x] or lower at 15-40% [xi]. This suggests that more rigorous project selection and management criteria could be applied, and that contestability could be more effective. Analysis of long term, reliable German data demonstrates that only the best research institutions consistently deliver outstanding results[xii].

Administrative issues, including the tendency for RDCs to develop a burgeoning bureaucracy (e.g. creation of a Council of Rural Research & Development Corporation

Chairs or excessive executive remuneration) would become of no concern to government if RDCs were totally privately funded.

Programme Management

Being 'market driven' does not mean that industry solely selects and directs projects. In AMIRA and ACARP there is close collaboration and mutual respect between the research community and industry in those projects which work well. Over time, researchers come to appreciate the problems and issues confronting industry and industry representatives appreciate the insights and creativity displayed by researchers. This can be equally true of agriculture.

Whilst AMIRA style collaborative projects may only account for a small proportion of total industry research expenditure, it is important as a source of 'front end seed funding'. Many AMIRA collaborators also have 'one on one' projects with the same researchers and often carry out complementary 'in house work'. Opportunities for this type of work are more limited in agriculture but effort along these lines is needed to bring more food and processing industries on side.

The Commission queries (P13) the RDC ability to exert *"undue influence*" on CSIRO or other organisations. What's wrong with that? Bear in mind that CSIRO and other research organisations have alternate funding sources. CSIRO 'Horizon 3', 'blue sky' or 'disruptive technology' projects[xiii] are funded separately, from appropriation funding, currently at record levels[xiv]. It is quite appropriate that industry influence be brought to bear, including on marginally funded projects. My personal experience in recent years is that RDCs may be too reluctant to exert their market power when warranted.

Intellectual Property

Intellectual Property issues often consume undue resources as there appears to be a view that significant revenues are lost by not applying a strict regime. There is not much evidence to support this view as far as collaborative research is concerned. Both AMIRA and ACARP are content to allow IP to rest with the research organisations should they wish to prosecute IP ownership. On occasion, a royalty may be payable, but the prevailing viewpoint in commodities research is that first user advantage far outweighs the costly bother of retaining IP[xv]. The corollary in agriculture is getting results out to the producer or processor.

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June 2010

References and Endnotes

[i] Rural Research and Development Corporations, Productivity Commission Issues Paper, March 2010

[ii] Primary Industries and Energy Research and Development Act 1989

[iii] Reading, P. 'The GRDC Investment Process', GRDC Ground Cover, May-June 2010 pp16-17.

[iv] It is not always the case that companies use the results. A Company may change direction during a project, a 'project champion' may leave, the company may be acquired or liquidated.

[v] see for example 'the Role of Government in Funding Research and Development', Dr David Charles, March 1994, 52pp produced for the GRDC in its submission to the Productivity Commission inquiry into R&D.

[vi] e.g. 'Maintaining support for agricultural research and development', Professor John Mullen, public lecture Melbourne University 2 June 2010, as a preamble to the current Productivity Commission inquiry.

[vii] Unpublished address by Professor Richard Williams, Anglo American Professor of Mineral and Process Engineering, Leeds Institute of Particle science and Engineering, to the AMIRA International Vice President technology Forum, March, 2004.

[viii] Mullen, see note vi

[ix] Industries and sectors benefiting from research principally funded by the minerals industries include health care, pharmaceuticals, bio-materials, nanotechnology, polymer surface coatings, digital data processing, software development, instrumentation, ink-jet printing, pulp and paper, ceramics, opthalmics, light metal manufacture, aeromagnetics, aerospace, consulting, packaging, food, power generation, water treatment and service industries.

[x] Productivity Commission Report 2007

[xi] Mullen, J., 2007 'Productivity growth and the returns from public investment in R&D in Australian broadacre agriculture', Australian Journal of Agricultural and Resource Economics, 51, no. 4, pp359-384.

[xii] Unpublished address by then Chief Scientist, Robin Batterham, to the AMIRA International Vice President technology Forum, March, 2004.

[xiii] A commonly used classical descriptor of research, invention and innovation is: 'Horizon 1' – Maintaining and mastering existing technology; 'Horizon 2' – Advanced technological optimization; and 'Horizon 3' – Discovery and application of disruptive technologies.

[xiv] CSIRO media release 8 May 2007 No: 07/77

[xv] E.g. John Marsden's analysis of the copper industry ('Technology Development and Competitive Advantage: Sustainable or Short Term?', SME Plant Operators Forum, 2004). Marsden claimed that first movers got fifteen years competitive advantage from their application of technological breakthroughs in Flotation -solvent extraction and electro-winning. (Quoted by the then Chief Scientist, Dr Robin Batterham, AMIRA International Technology Forum, March 2004). There are other similar examples, e.g. in 'thickener research' at the Parker Centre CRC and in exploration research at the CRC for Predictive Mineral Discovery.