

Measuring economic, environmental and social returns from Rural Research and Development Corporations' investment



Australian Government

Cotton Research and Development Corporation

Grains Research and Development Corporation

Fisheries Research and Development Corporation

Land & Water Australia

Rural Industries Research and Development Corporation

Sugar Research and Development Corporation

Grape and Wine Research and Development Corporation



AUSTRALIAN EGG CORPORATION LIMITED



Introduction

Australia's productivity growth, which is driven by innovation from investment in research, development and extension, puts the nation in a pre-eminent position to meet the growing global demand for primary industry products.

In part, this growth is generated by the Rural Research and Development Corporations (RDCs). There are 15 RDCs¹, which form a partnership between industry and government. Their role is to prioritise, coordinate and integrate the demands of industry and government with the capabilities of research providers.

The RDCs currently invest around \$540 million per year in R&D (including marketing) to improve the profitability and sustainability of rural industries and communities. For every \$1.00 contributed by the Australian Government, industry levies and contributions add a further \$1.50, on average. This serves to leverage the total investment and create far greater benefits for Australia than would otherwise be the case.

The structure of the RDCs and the extensive collaboration between the organisations involved promotes effective research, development, innovation and extension of research findings in priority areas such as climate change and natural resource management. The ability to tackle projects² jointly increases efficiency and can result in more effective communication and uptake of the outcomes of R&D. This contributes directly to the growth in productivity in Australian agriculture.

The RDCs embrace the Australian Government's National Research Priorities and Rural Research and Development Priorities in their investment, evaluation and reporting frameworks. Alignment with these priorities is a key consideration when setting strategic directions and making key investment decisions.

This report provides the results of the first year of an ongoing collective evaluation of the impact, effectiveness and return on investment from the RDCs. Further work by the RDCs over the next two years will build on these results. The evaluation was undertaken to provide robust and objective information on the overall economic, social and environmental returns produced by the RDC portfolio. This is the largest evaluation of rural R&D undertaken so far in Australia.

Context and purpose

Individually, RDCs use a range of evaluation approaches to report value to stakeholders and to provide recommendations and guidelines for ongoing and future investment. In 2007 the RDCs agreed to work together to measure and report on the overall return on R&D investment. The methodology and approach developed by the RDCs in this process will be of use to a wide range of R&D investors. This is particularly important in the areas of social and environmental benefits where common tools and frameworks are still evolving.

The projects assessed for this report included projects in the priority areas of improving productivity, developing supply chains and markets, and natural resource management. Climate change also featured in a number of projects. The evaluations were completed prior to the recent *Climate Change Research Strategy for Primary Industries* which is one of the RDC's major emerging areas of collaboration.

It is anticipated that this study will make an important contribution to the Australian Government's contemplation of the *National Innovation System Review*.

Evaluation framework

This evaluation focused on a sample of projects managed by the RDCs. It included projects that achieved significant milestones or had been completed between two and five years prior to 2006–07. This first stage evaluation report has three key components.

1. Examine the returns from 36 highly successful projects selected by the RDCs to demonstrate positive returns.
2. Examine the returns from 32 randomly selected projects (from a pool of over 600 projects relevant to the sampling period). The 32 projects, while not statistically representative of the pool, provide insights into the performance of the RDC portfolio. This randomly selected group will be increased in number in subsequent evaluations to allow statistically significant conclusions to be made.
3. Examine and evaluate a sample of current RDC programs that involve collaboration and have a high level of national importance. The area of biosecurity and food safety R&D was the first to be selected for review and several different biosecurity projects were evaluated.

The Council of Rural Research and Development Corporations' Chairs (CRRDCC) prepared the evaluation guidelines for this work. These guidelines were reviewed by key economic agencies of the Australian Government including the:

- Treasury
- Department of Finance and Deregulation
- Department of Agriculture Fisheries and Forestry
- Productivity Commission
- Australian Bureau of Agricultural and Resource Economics.

RDCs engaged independent economic consultants for the evaluations. In total, a pool of seven consultancies prepared the cost-benefit studies used as the basis of this evaluation report.

Results

Results from the first year of analysis show significant benefits from the investment by the RDCs.

- A sample of 36 highly successful projects will return \$10.5 billion in quantified benefits.
- Of the \$10.5 billion in quantified benefits, \$5.5 billion will be private benefits (that is benefits accruing to rural industries). The remaining \$5.0 billion will be benefits captured by consumers, other participants in the supply chain and the wider public.
- A sample of 32 randomly selected projects from the RDC portfolio will deliver an average return of \$11 for each dollar invested (in 2007 dollars).
- A range of significant social and environmental benefits were identified which are distributed broadly to the Australian community.

Background to results

The 36 highly successful projects will generate the \$10.5 billion return from a \$265 million investment by the RDCs and a \$200 million contribution from other funding partners. RDCs initiated and managed all 36 projects.

The returns attributable to the RDCs' \$265 million investment – \$5.9 billion – will more than pay for the entire \$4.5 billion invested by RDCs across 600 projects over the past 10 years. The purpose of examining the cost-benefit analyses from 36 highly successful projects was to establish that RDC investment was delivering positive returns.

While choosing highly successful projects proved the capacity of RDC investments to generate compelling returns, analysis of the 32 randomly selected projects from a pool of 600 relevant to the sampling period gives a clearer indication of average returns across the portfolio. While the focus of the current study was to evaluate the return on RDC investments, the evaluation also:

- demonstrates the strong collaboration between RDCs, rural industry, government and research partners
- shows that significant benefits are generated in areas targeted by the National Research Priorities and Rural Research and Development Priorities
- provides a sound basis for further combined evaluation work to:
 - measure the value of RDC investments
 - provide insights to individual RDCs about managing investments
 - provide leadership in approaches to evaluation of innovation in Australia.

Public benefits

This evaluation process has identified many public benefits and quantified them where possible. Where it has not been possible to quantify the benefits, the evaluation process uses a robust 'weight of evidence' case – involving the accumulation of *prima facie* evidence of improvements in environmental and social values for Australian society stemming from the RDC investments.

Taking both the highly successful and the randomly selected project groups into account, examples of public benefits include:

- improved biodiversity and increased carbon sequestration
- reduced soil erosion and improved water quality
- a reduction in food-borne infectious diseases

- increased efficiency in water use, together with improved water quality for many rural industries
- improved biosecurity
- more sustainable use of natural resources
- increased adaptability of rural industries to climate change.

Many of these benefits have been achieved through the RDC's coordination of projects that specifically address both industry and government rural research priorities. A small sample of the public benefits that could be quantified include:

- \$503 million in social and related industry benefits in food safety from a Meat and Livestock Australia investment of \$2 million in food safety research
- \$10 million that did not have to be spent on social adjustment for fishing industry dependent communities had the proposed Marine Protected Areas been implemented in the proposed areas, rather than being relocated
- \$48 million of total quantifiable environmental benefits as a result of investment by Australian Wool Innovation, with contributions from Land and Water Australia and Meat and Livestock Australia in the Land, Water and Wool project aimed at improving productivity and natural resource management
- \$162 million in public benefits from improved water-use efficiency in rice production resulting from expenditure of \$2 million.

CRRDCC will invest in improving the methodology to quantify the assessment of social and environmental benefits for future evaluations. While most of the evaluation process has focused on RDC impacts, there is also considerable value in maintaining R&D capacity so that RDCs can absorb international innovations and respond to particular emergency needs as they arise. The maintenance of the RDC investment capacity gives Australian agriculture, fisheries and forestry a seat at the international rural R&D table. Prominent examples of this are:

- the transfer of genetically modified cotton technology through the Cotton Research and Development Corporation
- Australia's participation in international cereal breeding programs through Grains Research and Development Corporation investments in the International Maize and Wheat Improvement Center (CIMMYT).

The evaluation of the RDCs has included an analysis of the insurance value of RDC biosecurity investments. The RDCs have directly invested around \$35 million per year on biosecurity projects in collaboration with a number of organisations including the CRCs for Australian Biosecurity and National Plant Biosecurity, CSIRO, the Australian Animal Health Laboratory, Animal Health Australia and Plant Health Australia. An assessment of three biosecurity projects indicated returns of \$135.15 million over ten years direct investment of \$1 million from several RDCs. The bulk of these benefits arose from reduced costs arising out of earlier diagnosis of horse flu from technology developed originally to detect avian influenza.

Collaboration

Analysis shows 32 of the 36 highly successful projects (89 per cent) and 22 of the 32 randomly selected projects (69 per cent) involved collaborative funding.

RDCs have a unique perspective that is provided by their close engagement with industry and their intimate knowledge of market conditions that is not easily and regularly assessable either by government or the research community. Additionally many of the RDCs have ensured collaboration by involving industry (from all parts of the value chain) in boards, panels, reference groups and specialised regional development groups. This has enhanced capability, engagement and knowledge diffusion.

Conclusions

It is clear from the results that the RDCs generate significant economic, social and environmental benefits for Australia in key areas that have been determined as priority by rural industries and the Australian Government. Returns from a small number of highly successful projects are greater than the cost of the total investment in R&D. Further, a randomly selected set of projects shows a strong average return on investment across the portfolio.

Lessons learned from this initial year of evaluation will be used to strengthen the ongoing evaluation. Social and environmental outcomes are difficult to quantify, leading to a likely understatement of their value. Improved tools and techniques are needed in these areas to be able to capture and value social and environmental outcomes. This is particularly important in areas of priority to government policy makers.

Evaluation methodologies for these issues must be developed in conjunction with other non-RDC parties to ensure that the measures deliver maximum utility to key stakeholders.

Ultimately, the results and methods will have value well beyond the RDCs themselves.

The full version of this report is available on the CRRDCC website [www.ruralrdc.com.au] or by calling the secretariat on 02 6103 8200.



Council of Rural Research and Development Corporations' Chairs Secretariat

Phone: 02 6103 8200

Fax: 02 6103 8233

Email: secretariat@ruralrdc.com.au

Postal address:

GPO Box 1322

Canberra ACT 2601

Street address:

Level 1, 33 Ainslie Avenue

Canberra City ACT 2600