Australian Government
Australian Centre for
International Agricultural Research

28 June 2010

Inquiry into Rural Research and Development Corporations
Productivity Commission
Locked Bag 2
Collins Street
East Melbourne VIC 8003

Attention: Yvette Goss

Dear Ms Goss

I am attaching a submission from the Australian Centre for International Agricultural Research (ACIAR) addressing the inquiry into the Rural Research and Development Corporations.

The ACIAR submission focuses essentially on international agricultural research and research impact assessment issues. As such the submission does not address governance matters which we believe are more correctly addressed by other contributors to the inquiry.

If you or your colleagues wish for any elaboration or explanation on the matters contained in this submission, do not hesitate to contact either Dr Simon Hearn, Principal Adviser, or myself.

Yours sincerely

Nick Austin
Chief Executive Officer

Australian Government

Australian Centre for
International Agricultural Research

SUBMISSION TO THE

PRODUCTIVITY COMMISSION INQUIRY INTO RURAL RESEARCH AND DEVELOPMENT

16 June 2010

Contents

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

Background

The Australian Centre for International Agricultural Research (ACIAR) is a statutory authority that operates within the Foreign Affairs and Trade portfolio. The Centre's activities are part of Australia's aid program, with the objectives of advancing Australia's national interest through poverty reduction and sustainable development. ACIAR was established in 1982 to assist and encourage agricultural scientists in Australia to use their skills for the benefit of developing countries while at the same time working to solve Australia's own agricultural problems.

ACIAR commissions research groups and institutions, including universities, CSIRO and state departments of primary industry, private consultants and non-government organisations (NGOs) to carry out agricultural research projects in partnership with their counterparts in developing countries (covering 25–30 countries). This includes:

- commissioning research into improving sustainable agricultural production in developing countries
- funding project-related training (postgraduate and short training courses)
- communicating the results of research
- conducting and funding development activities related to research programs, including capacity building
- administering the Australian Government's contribution to the International Agricultural Research Centres (IARC).

Research funded by ACIAR aims to help developing countries to help themselves, by contributing to solving agricultural problems and building research capacity. As such ACIAR's activities relate directly or indirectly to the inquiry's broad terms of reference covering:

- the nature and extent of existing international research collaborations
- the benefits to Australia from engaging in international research collaborations
- the key drivers of international research collaboration at the government, institutional and researcher levels
- the impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these
- principles and strategies for supporting international research engagement.

Introduction

ACIAR commissions collaborative research between Australian and developing country researchers in areas where Australia has special country-relevant research competence. In 2009-10 it allocated $72 million for research across a number of scientific and technical disciplines, including: livestock production systems, animal health, fisheries, crop improvement and management, crop protection, horticulture, forestry, land and water resources, soil management and crop nutrition, postharvest technology and smallholder farm systems. ACIAR also supports economic and social science research in its agricultural development policy and agricultural systems economics and management programs.

In allocating investment, ACIAR brings together the agricultural research and development (R&D) priorities of the partner countries with the interests and capabilities of Australian researchers or research groups. ACIAR also supports International Agricultural Research Centres (IARCs), primarily those operating under the umbrella of the Consultative Group on International Agricultural Research (CGIAR), to undertake R&D of common interest to Australia and developing countries.

ACIAR is unique in that it is part of Australia's innovation system while also being an integral part of the development assistance program. ACIAR has had an extensive program of impact evaluations in place since 1998, with a strong focus on developing the methods of evaluation which are addressed in summary format in this submission. Extensive information is also communicated on impact evaluations on the ACIAR website: www.aciar.gov.au.

This submission introduces ACIAR's position in Australia's overseas aid and innovation systems, and briefly discusses the:

- effectiveness of R&D as a form of international development
- pathways in developing countries by which ACIAR's R&D delivers public benefits, and relevance for the Australian innovation system
- spillovers to Australia of this international R&D—which are both demonstrable and substantive
- evaluation approaches and methods that ACIAR has developed over the last 20 years.

It is intended that this focus will provide the Commission with a brief description of Australia's agricultural research partnership approach with developing countries which works in parallel with the Research and Development Corporations (RDCs) emphasis on enhancing productivity and sustainability in Australia. It is also observed that ACIAR frequently engages with the same research provider organizations in Australia as the RDCs, but the overseas research collaborators in developing countries are generally not involved with the RDCs.

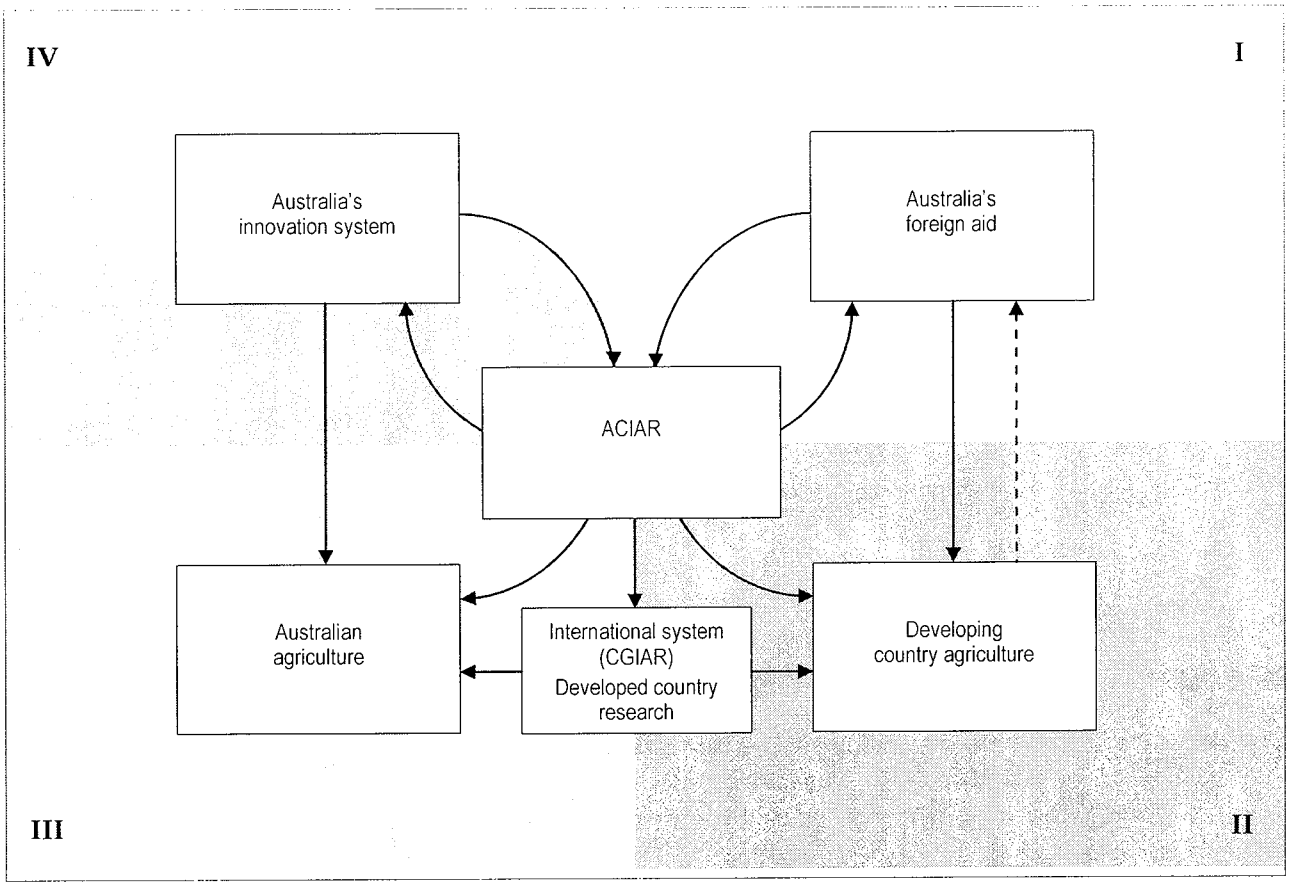
Australia's research partnership approach

ACIAR's success in generating benefits for developing country partners builds on its ability to attract Australia's scientific resources into looking at particular categories of agricultural problems. This use of Australian research resources provides the link to Australia's innovation and research system.

These linkages are illustrated in Graph 1. Schematically, ACIAR enables a number of important interactions. The best known interaction is illustrated in quadrant II of the graph, the delivery of research outcomes to developing country agriculture.

This is an effective way of transforming aid funds into benefits, and explains why ACIAR was established as part of Australia's international development cooperation program (quadrant I of the graph). ACIAR funds R&D projects in cooperation with partner agencies in developing countries. It draws on resources in the international agricultural research system, such as the IARCs under the CGIAR umbrella, and other research undertaken in developed countries.

Graph 1: ACIAR, aid and Australia's innovation system



Source: Pearce, Monck, Chadwick and Corbishley, 2006

ACIAR-funded research also delivers direct benefits to Australian agriculture (quadrant III). These benefits arise through ACIAR's ability to access the global knowledge base and to combine aid funding with Australian research expertise, to examine issues that are of benefit to agriculture in partner countries and around the world. The extent of these mutual research benefits varies from project to project and the focal issues of each research endeavour.

ACIAR's activities interact with Australia's innovation system (quadrant IV) largely through the involvement of Australian researchers and research institutions (universities, state departments of agriculture and government research bureaus, Cooperative Research Centres and the Commonwealth Scientific and Industrial Research Organisation (CSIRO)). These include:

- leveraging funding into areas of importance for Australian agriculture
- providing access to a broader pool of researchers for problems of interest—that is, providing access to international expertise and environments
- increasing the overall research base for agricultural issues of interest to Australia
- contributing to the overall stock of knowledge in an international context and thus helping identify both promising areas for research and the less prospective 'dry wells'.

In particular, ACIAR places an emphasis on agricultural research to achieve sustainable development and natural resource management by funding research that directly contributes to Australia's pursuit of better outcomes in areas such as water management, soil degradation, biodiversity and climate

change responses. Similarly, ACIAR's projects dealing with food safety, animal and crop health and biosecurity concur with and contribute to Australia's need to maintain and enhance its agricultural and food health and safety status. This achievement is partially a reflection of the fact that many developing countries with which ACIAR engages in research partnerships experience similar environmental and biosecurity challenges as Australia. In some instances research undertaken in developing countries can constitute a more cost effective means of information generation than research undertaken in Australia alone.

Agricultural productivity growth for economic development

Agriculture remains a predominant sector of the economy in most of Australia's development partners, and is the source of livelihoods for the majority of the people. Typically rural people comprise the bulk of the population living below or near the poverty line. Improving the productivity of agriculture is therefore essential to reducing poverty and to achieving economic growth through promoting domestic savings and releasing labour for alternative uses.

Agriculture in many developing countries is land and labour intensive. Productivity is hampered by lack of access to capital and often to inputs such as suitable varieties, water and fertiliser. Agricultural activities are regularly exposed to pests and diseases, and the risk management response of high degrees of diversification limits scale economies. There is considerable scope for R&D to address these constraints and to improve productivity through reducing the costs, variability, quality and variety of production.

Evaluations of ACIAR's projects indicate the high returns that can be realised from this kind of research. A recent review of the returns to ACIAR's bilateral R&D investments showed that the benefits from projects accounting for 11.1% of total investment had a benefit:cost ratio of about 54:1 (Harding, Jiang and Pearce 2009). The benefits from this selection of projects alone represent more than three times ACIAR's total bilateral investment to date of $2.1 billion (2008 dollars). These high rates of return partially reflect the yield gaps existing in a number of developing countries and the contribution of agriculture to those economies.

The returns to R&D in agriculture in developing countries are particularly high as there are frequently scientific capacity constraints, and the stock of knowledge is often low. The need for adaptation of technologies to local conditions limits the ease of direct transfer of knowledge, technologies, or germplasm.

ACIAR has also recognised that the enabling environment for agriculture is critical for harvesting the full return on potential productivity growth. The policy and institutional environment influences the flow of agricultural inputs and outputs, and shapes the incentives for investment in new ways of doing things and investment in physical and human capital. Consequently, ACIAR also supports policy-oriented research that complements the technical R&D with the objective of better realising the potential benefits by removing barriers to adoption and improving market access. The Centre is increasingly relating its economic and policy research projects to the scientific investments, recognising that successful science uptake depends heavily on establishing the most suitable policy and institutional settings in recipient countries.

Australia's research capacities

Australia is particularly well placed to provide agricultural R&D across a range of commodities having a long history of agricultural research in public institutions such as the state departments of agriculture, CSIRO, and the universities.

ACIAR facilitates the undertaking of agricultural research in developing country partners by working with the countries to identify their needs and priorities. These are matched with Australian providers who identify the opportunities to extend their work to meet developing country needs in agricultural science and related disciplines. ACIAR also funds R&D to assess and enhance the policy environment affecting the adoption of the results of the research undertakings.

This approach adds value by forming partnerships with international agricultural R&D organisations, Australian organisations and the research agencies in the developing partner countries, thereby enhancing the effectiveness of the R&D investments. Co-funding opportunities and access to expertise and the Australian stock of knowledge lie at the core of these productive partnerships.

ACIAR R&D benefits to developing partner countries

ACIAR's impact assessment program provides robust evidence of the size of the benefits being delivered by its activities. It is estimated that the 90 ACIAR-funded projects that have been subject to impact assessments have delivered benefits that total $12.6 billion to developing country partners and Australian agriculture for a total outlay of $234 million. Approximately 90% of the benefits accrued to developing country partners: the remaining 10 per cent accrued to Australian agriculture.

A meta-analysis of these evaluations (Harding, Jiang and Pearce, 2009) has extended Raitzer and Lindner's review of returns to ACIAR's bilateral investments (Raitzer and Lindner, 2005). It shows that if the benefits from the activities are 'attributed' to ACIAR on the basis of ACIAR's share in total project costs, then the total benefits attributable to ACIAR are $6.8 billion, with benefits net of ACIAR's costs of $6.7 billion.

These benefits accrue through a number of pathways. The most obvious is through direct productivity improvements from new production technologies or techniques, or through new breeds and varieties. ACIAR research has also led to benefits from management of, and protection against, disease and pest incursion, increased demand in third country markets from meeting food safety, quarantine and quality requirements, and environmental, bio-diversity and sustainability improvements associated with management of natural resources.

Public good research

Public goods are defined as a good or service that is non-rivalled and non-excludable. This means that access to, or consumption of, the good or service by one individual does not reduce availability of the good or service for consumption by others, and that no one can be effectively excluded from using the good or service. It is generally provided to the public without profit. Technology can be exclusive where knowledge is essential and benefits are limited to those who have the capacity to access (and use) the information.

Experience shows public good R&D tends to deliver very high returns. For example, a project aimed at developing and delivering bio-control of the banana skipper pest in Papua New Guinea, generated estimated benefits of $555 million for an outlay of $2.1 million (benefit:cost ratio of 258:1) (Waterhouse, Dillon and Vincent 1998).

Partnership with commercial players in the distribution of publicly funded R&D outcomes is a common pathway for adoption of new varieties and in some cases techniques. Partnership at the R&D stage can also raise the level of R&D funding and provided a pathway for adoption. A good example is the development of the hybrid pigeonpea by the International Crops Research Institute for the Semi Arid Tropics (ICRISAT) in partnership with a seed company. ACIAR funded the early research on the short duration pigeonpea that was fundamental to the development of the hybrid

technology. The low income level of farmers and price sensitive demand, combined with low marginal costs, means that the seed company's optimal strategy is to price for maximum adoption, maximising the benefits from the research. The value of this R&D for India is estimated at $130 million.

In some developing countries where ACIAR works, the policy and institutional environment may not be conducive to the operation of commercial supply of new technologies. Alternative pathways have to be utilised or developed such as public sector extension systems or linkages with other development assistance programs including NGOs. ACIAR is continuously seeking to further develop a greater diversity of both public and private partnerships to support the dissemination of new ideas that do not crowd out private initiative.

The joint benefits of collaborative R&D

The IARCs are committed to delivering R&D for public benefit, and to this end are working to define what R&D will satisfy this requirement. International public goods are defined as non-rival and non-excludable across a number of countries. This narrow focus, would however, exclude many R&D investments that can deliver considerable public benefits.

ACIAR's work on forestry in transition economies is a valid example. ACIAR, along with a number of other organisations, supported the development of high-yielding eucalyptus plantations in China over a 20 year period. While the research delivered productivity improvements in an essentially commercial activity, there were considerable benefits in terms of improving the living standards of rural people in southern China. The activity resulted in significant environmental benefits from sources such as: reduced pressure on natural forests, provision of biological corridors, reduced water-borne soil erosion, improved water quality and protection of agricultural crops from winds, sandstorms and soil erosion.

In many developing countries, lack of capital, skills, and communication mechanisms to access information mean that people are often excluded from using information that is potentially useful to them. In these circumstances participatory R&D partnerships allied with communication and extension strategies can deliver public benefits. The difference compared to Australia's innovation system is that in Australia access to capital, skills and communication are not, at least to the same extent, limited by education levels, public policy or state and private monopoly impediments.

Independent impact evaluations of ACIAR-funded projects suggest that these have delivered significant spillover benefits to Australian agriculture. There are over 20 projects for which benefits to Australia have been quantified. In present value terms, these benefits come to $1.2 billion.

These quantified benefits arise in four main categories:

- direct production benefits (44% of the total) arising through research findings that directly improve the productivity of Australian agriculture
- indirect protection from disease or pest incursion (35% of the total) that arises from applications of research findings that lower the chance of a disease or pest ever entering into Australia
- direct protection from disease or pest incursion (12% of the total) arising from research findings that allow more effective quarantine or more effective control of disease or pests incursions
- increased trade benefits (9% of the total) arising through research that increases the value of Australian exports.

It is not possible to attribute all of the benefits to ACIAR alone. Given the highly networked nature of Australian agricultural research, the benefits to these projects are likely to have emerged because of a combination of ACIAR funding and past funding from other agencies. At the same time, there are further sources of benefits to Australian agriculture that are difficult to quantify. These include improvements in biodiversity in partner countries that may be valued by Australians, training of researchers and general increases in the stock of knowledge that may be applicable in the Australian context, and may increase the probability of success or lower the cost of other research.

As well as these direct benefits, ACIAR's activities are well acknowledged in partner developing countries, enhancing Australia's recognition in the region. ACIAR's comprehensive program of impact evaluations guides investment in consultation with developing countries.

Evaluating research impact

ACIAR has, from its beginning, placed significant emphasis on assessment of the impact of the research it funds, particularly focusing on quantifying the returns to research investments. It has used these assessments to account to stakeholders and to support improved decisions making and management of its funds. ACIAR has applied the extensive body of existing literature to this area of investment analysis and has also contributed to this literature through this process.

In ACIAR's early days, quantification of potential economic impacts were used to support aggregate priority setting and more effective project development, as well as enhancing the Centre's public accountability. As research efforts matured, more attention was given to quantifying the returns to completed projects by estimating adoption and measuring economic impact, and learning from findings of the assessments.

The Impact Assessment program currently runs two types of finished project assessments. The first is a set of 'adoption studies'. The rolling program of 'adoption studies' became part of ACIAR's evaluation strategy in 2003-04. Adoption studies are undertaken on completed projects where ACIAR expenditure was greater than $400,000, and for which there is no follow-on project. The adoption studies are undertaken by the Australian project leader (or other nominated person), 3 years after the completion of the project.

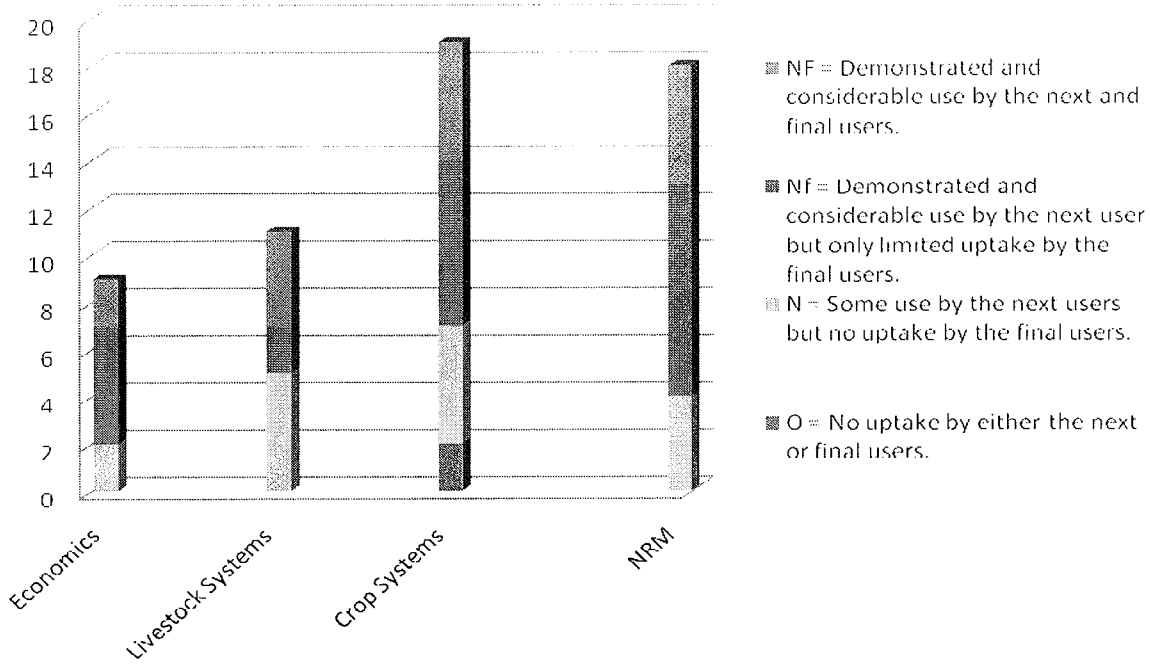
The primary purpose of the adoption study is to provide ACIAR with qualitative, and where possible, quantitative information on the difference the project made at the scientific and community levels in the relevant developing country(ies) and Australia. In addition, where the project has not resulted in any practice change by either the next or final users, information on the reasons for the lack of uptake is sought.

As the focus of the adoption studies is largely international, the original Australian project leader is generally required to revisit the partner country to determine the uptake of project results through discussions with the collaborating institutions and the potential and/or realised users of the project results. The project leader is also asked to comment on adoption and impact of the project results in Australia. Adoption studies are compiled annually into an Adoption Study publication (http://aciar.gov.au/node/6726).

By 2008/09, six Adoption Study publications were completed, covering 57 projects. Around 65% of the adoption studies were undertaken in the crop systems and natural resource management (which includes forestry) portfolios. This reflects both the absolute size of those two portfolios and the higher proportion of larger projects compared with the economics and livestock systems (which includes fisheries) portfolios. A qualitative assessment of the uptake of the project results suggests

that in all but two cases there has been at least some uptake by the next users with the majority of studies reporting considerable uptake by the next users and at least some adoption at the community level (Figure 1).

Figure 1: Number of Adoption Studies by research area and level of uptake



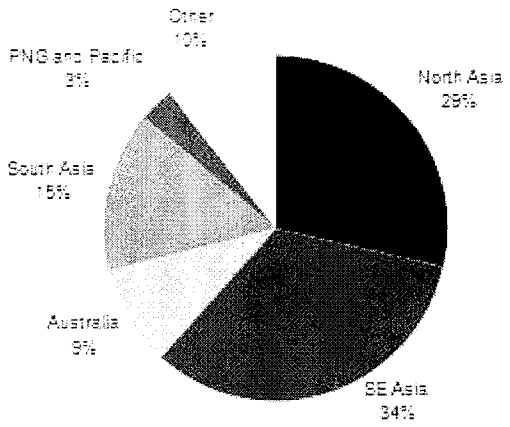
The second finished project evaluation is an impact assessment study (IAS). Most of the economic impact assessments have been undertaken by independent economists with special expertise in this R&D impact evaluation area. These studies involve extensive review of project adoption and impact in the partner country and Australia. The impact assessments provide estimates of the returns to the research investment on a project or suite of projects. These returns are based on estimates of the economic impacts. A qualitative assessment of social and environmental impacts is also requested. In recent years ACIAR has also commissioned evaluations to quantifying the benefits from capacity building impacts (see below).

Over the past five years, there has been a move away from assessing the impact of individual projects to undertaking thematic evaluations of large numbers of projects in similar disciplinary and/or geographic areas. Two good examples are the study on ACIAR fisheries projects in Indonesia (http://aciar.gov.au/publication/IAS55) and the review and impact assessment of ACIAR's fruit fly research (http://aciar.gov.au/publication/IAS56).

ACIAR has also commissioned several reviews of these studies to assess their credibility and placed all returns in the same terms (http://aciar.gov.au/publication/IAS35; http://aciar.gov.au/publication/IAS39; http://aciar.gov.au/publication/IAS41). Since the earlier reviews, a significant number of further assessment studies have been undertaken. As a result, using the recently developed ACIAR Database for Impact Assessments (ADIA), which facilitates systematic analysis of the results of the impact assessments and provides summary information for a range of uses, an update of the previous studies of returns to ACIAR research was undertaken in 2008-09. This review analyses the results of 37 impact assessments covering 90 projects.

For all the assessed projects there have been total benefits of around $12.6 billion for a total investment of approximately $234 million in 2008 dollar present value terms. Of the total benefits $11.4 billion accrue to developing countries and $1.2 billion to Australia (see Figure 2 for a regional breakdown of benefits). The average benefit cost ratio across all projects assessed is 54.

Figure 2: Distribution of total benefits from assessed ACIAR research projects by region



ACIAR's Impact Assessment program has also commissioned a series of studies to assess the impact on Australia of research undertaken by some of the Centres that are a part of the CGIAR network. These were undertaken because around 20% of ACIAR's annual funding supports research through the IARC system (primarily the CGIAR). The IARCs covered in these assessments in assessments to date include the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Center for Agricultural Research in Dry Areas (ICARDA), the International Maize and Wheat Improvement Center (CIMMYT) and CAB International (CABI) (see for example http://aciar.gov.au/publication/IAS42) .

The Impact Assessment program is continuing to commission impact studies of CGIAR Center research although the focus will broaden to cover the benefits to ACIAR's mandate region (Papua New Guinea and Pacific Island Countries, South-East Asia, South Asia, North Asia, Southern Africa). The purpose of these studies is not to question whether or not Australia should support the CG System, but rather to ensure all aspects of ACIAR's investment portfolio are subjected to the same level of evaluation.

As part of the evaluations, areas for practical methodology development have been identified and advances developed. Examples are methods for measurement of poverty alleviation (http://aciar.gov.au/publication/IAS19) and the impact of capacity building (http://aciar.gov.au/publication/IAS44). Contributions to methodological advances are continuing, particularly in the areas of measuring the returns to policy-orientated research and pathway analysis.

Following the analysis of past economic impact assessments, ACIAR and the Centre for International Economics (CIE) developed a set of guidelines for ACIAR impact assessment studies. Since a range of project leaders (for the adoption studies) and independent consultants (for the more detailed impact assessments) are engaged to undertake the analyses, the primary purpose of the guidelines is to provide a basis for consistency between the adoption studies and the impact assessments.

ACIAR has also worked closely with the International Food Policy Research Institute (IFPRI) in developing a common impact assessment software for undertaking IAS's. The Dynamic Research EvaluAtion for Managers (DREAM) software system is an impact assessment tool that enables analysts to readily calculate the size and distribution of the economic benefits from agricultural research and development activities using a range of market model options. DREAM is based on the concepts and methods described in Science Under Scarcity: Principles and Practice for Agricultural Research Evaluation and Priority Setting by JM Alston, GW Norton and PG Pardey (1995). The DREAM model is accessible from the International Food Policy Research Institute (IFPRI) website free of charge.

Finally, the experience gained through all these activities has been used to provide two broad types of training courses. The first is for research groups to help ensure that eventual adoption and impact is an integrated part of research project design and management. The second is to provide agricultural economists with the framework and skills to undertake detailed quantitative impact assessments.

Capacity building impacts

ACIAR projects often involve substantial training components at both formal and informal levels. An important and recognized feature of ACIAR's research partnerships is the provision to enable learning by work experience for collaborating scientists in developing countries. This learning by doing approach is supplemented by the funding of formal scholarships for postgraduate degrees and training programs for research managers selected from developing country agencies. ACIAR also works closely with the Crawford Fund training Program which fund formal training programs in-country and in Australia for agricultural researchers and policy makers. ACIAR and the Crawford Fund collaborated to develop a framework for evaluating the capacity building results of research projects.

The framework identifies:

- capacity built:
  - at the individual level this is the knowledge, skills, competencies, attitudes and contacts acquired as a result of the training
  - at the organisational level it is the addition to the stock of knowledge of the organisation (not embodied in the individual), the quantum of skilled people and the overall awareness and understanding
- capacity utilised:
  - at the individual level this is the application of the capacity built to raise their own productivity and/or achieve promotion
  - at the organisational level utilisation of capacity is reflected in improved efficiency (productivity), innovation, or effectiveness
- impact on farmers (the usual target):
  - directly through adoption of new varieties and technologies, or
  - indirectly through improvement in the operating environment that enhances market access, access to resources, diversification or reduced uncertainty, so enhancing income security, or lowering transaction costs.

ACIAR has started to commission evaluations using this methodology. One has looked at the training component of the ACIAR investment in pigeonpea breeding research at ICRISAT. The project had

aimed to develop Australian germplasm for use in India, but it turned out to be unsuitable. However, the techniques learned and understanding gained clearly brought forward the development and adoption of a suitable short duration variety by several years. Thus the main value of the project came from the process of undertaking the R&D not the output of the R&D. The capacity building activities associated with the project were estimated to produce benefits with a net present value of close to $68 million (Gordon & Chadwick, 2007). The work also identified the way forward for the subsequent development of hybrid varieties, an increment in knowledge that generated a new research agenda.

Evaluation of policy research

Evaluation of policy research also presents significant challenges. A review and meta-analysis of ACIAR's policy research (Pearce 2005) identified some of the key challenges.

Attribution: research is almost never the sole factor triggering policy change.

Circularity: the benefits of policy research are typically evaluated using the same tools that are themselves products of the policy research.

Implementation difficulties: one of the most plausible approaches to evaluating the effects of policy research, Bayesian decision analysis requires obtaining 'before' and 'after' probabilities from decision makers.

Valuation: the value of policy changes that are public goods cannot easily be imputed using observed market prices and costs (as can the impacts of technical research).

Poison wells: not all ideas generated by economic research are worth implementing—evaluation of policy research inevitably involves judgments about the usefulness of the ideas that emerge.

Some policy research projects have been covered by ACIAR's impact assessment work. Table 1 summarises the estimated benefit cost ratios for these projects.

The review reinforced the logic of a decision made by ACIAR's previous Board of Management in May 2004 to approve a strategy to make greater use of pilot or scoping studies to assess policy issues before making major technical research investments. The Board considered that it may also be important to have research on these important policy issues and their economic implications undertaken alongside or integrated with the technical research. This can be important to ensure that the technical research takes the possible impacts into account or works to foster improvements in policies.

Table 1: Benefit cost ratios for selected ACIAR policy projects

Project	Estimated ratio of benefits to costs
Analysis of socioeconomic and agribusiness developments in the Chinese beef and cattle industry	60
Raw wool production and marketing in China	40
Emergence and integration of regional grain markets in China	6 to 30
Establishment of a protected area in Vanuatu	4.5

Source: Pearce, 2005, McWaters and Templeton, 2004, Watson 1998, Mullen, 2004 and Centre for International Economics, 1998

This approach reflects the recognition that policy settings have the potential to be a major influence on the effectiveness and impacts of particular technical research projects. Policy settings may

negatively affect the incentives that shape the willingness of producers to undertake the investments associated with adopting the results of technical research. Policy distortions can lead to situations in which the introduction of new techniques has counter-intuitive and sometimes counter-productive effects. ACIAR considers that undertaking policy and related economic assessments at the same time as the technical research can therefore be important to ensure maximum uptake and adoption of the technical results.

Evaluation of poverty impacts

ACIAR has also worked on the development of a framework for measuring the impacts of its research projects on poverty. Box 1 summarises the issues that have been identified in attacking this problem (Pearce, 2002).

Box 1: Measuring the impacts of research projects on poverty

Measuring the impacts of a project on poverty requires a good understanding of:

- the technical impacts of the project
- the pathways by which the project will affect the incomes, risk profiles and expenditure of different groups within the affected community
- the merits and pitfalls of different definitions of poverty
- the merits and pitfalls of different quantitative measures of poverty
- within any given definition (when will the headcount ratio be misleading? when should inequality be measured? how should a poverty line be established? and so on)
- how to establish a baseline estimate of poverty, including the use of household surveys and other data-collecting techniques
- how to measure and simulate the income and expenditure patterns of different groups within the affected community
- how to asses economic interactions between different groups in the community.

Poverty evaluation is very much more complex than standard benefit:cost evaluation, as it requires that something be said about the impact of the projects on different groups. Further, some of the largest poverty effects of a project may be indirect, so more attention must be paid to the interactions between those groups affected.

ACIAR has commissioned reviews of the poverty impact of some of its projects. One example is the project targeting bio-control of the banana skipper pest, which was estimated to lift some 43,000 people in Papua New Guinea above the poverty line, through averted income losses and cost increases (Warner and Bauer 2003).

Conclusion

ACIAR's operation is at the interface between Australia's innovation system and its development assistance program provides for some insights that may be useful for this inquiry into Australia's agricultural research model.

ACIAR funds collaborative research that draws on resources from parts of the innovation system and targets the pursuit of more productive and sustainable agricultural systems for the benefit of developing countries and Australia.

Funding R&D in agriculture, forestry and fisheries is an effective form of development assistance as increased productivity in these sectors is a critical ingredient to growth. As so many poor people in

the developing countries targeted by Australia's aid program are dependent on rural activities for their livelihoods, aid which improves their incomes or helps them better manage risk can make an important contribution to reducing poverty. ACIAR's R&D funding thus targets R&D for the public good, a target made somewhat larger in many countries because the institutions that create incentives for private R&D are often very weak.

ACIAR has a long-standing program of quantitative evaluation of the impact of its activities. The evidence from this program confirms that the returns from agricultural R&D in developing countries are high, but that the distribution of the benefits is skewed, suggesting that there is a high probability of a healthy return, but a lower probability of an exceptional return. The assessments also show that there have been significant benefits to Australian agriculture from this research, showing that research does not have to be done in Australia to provide direct benefits to Australia.

ACIAR continues to refine and extend its assessment program, and is working on methodologies to evaluate the impact of policy research and capacity building. The evaluation program impacts on ACIAR's portfolio allocation. For example, evidence on the extent to which policy and institutional factors influence the conduct and uptake of technical research has led to an increased focus on pilot or scoping studies to assess policy issues before making major investments. It has also led to assessments of the policy and institutional environment at the same time as technical research.

Despite ACIARs limited size, some of the lessons from ACIAR's experience will be pertinent to the Commission's terms of reference, with particular application to:

- the nature and extent of existing international research collaborations
- the benefits to Australia from engaging in international research collaboration
- the key drivers of international research collaboration at government, institutional and researcher levels.

To ensure that public research expenditures are well spent requires assessing the likely impacts of prospective research, and the actual impacts of completed projects. It also requires being assured that the policy and institutional environment supports appropriate levels of adoption of research results by the relevant users. To make the best ongoing contributions, research needs to be conducted in an environment in which the stock of knowledge held by individuals and organisations is available to a broader research community and to agricultural producers as end users.

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