

# Measuring Research Impacts

Dr. Jeff Davis, Policy Linkages and Impact Assessment



AOP budgeted expenditure in 2007–08	\$450,000
Actual expenditure in 2007–08	\$494,734
Expenditure in 2006–07	\$358,544
Expenditure in 2005–06	\$684,307
Proportion of total ACIAR expenditure 2007–08	0.7%

Key performance indicators	Performance 2007–08
Publish five assessments of the impacts of completed projects in 2007–08.	Nine impact assessments (IA) were contracted during the year. Seven were published with the remaining two to be published in early 2008–09.
Publish the 2007–08 project leader adoption studies for the set of large projects concluded in 2003–04.	Adoption studies were undertaken for eleven projects and the report published.
Develop closer links with partner-country impact assessment groups to enhance estimation of technology adoption levels in future assessments. Training for partner-country impact assessment groups will also be included where appropriate.	The three IAs in the Philippines were undertaken with collaboration between the Australian contractor and Philippine groups including two major partner organisations who are developing this type of activity. The two Indian IAs and two Indonesian IAs also included collaborative links to people in the partner countries. Several training activities were included in this collaboration and past JAFs were also involved.
Develop collaboration with international CG centres in impact assessment activities, particularly of projects jointly funded through ACIAR.	Links were established with ICRISAT and ILRI for the two IARC project IA studies. Strong links were established with the CGIAR Standing Panel on Impact Assessment (SPIA). Agreement has been reached to expand ACIAR's IA activities for the CGIAR System and to collaborate with SPIA for these activities in 2008–09.
Provide feedback on the implications of impact assessment studies for research project development and management within ACIAR, through regular 'lessons learnt' style meetings.	Informal input has taken place for all IHRs. A presentation on 'lessons learnt' was given to one IHR. Presentations were also provided to the Commission and several partner decision-making groups.
Enhance the clarification and estimation of potential outcomes and impacts of new projects by assisting project research groups during the peer-review process of their proposals. In particular, summaries of the implications of impact studies will be provided to meetings of these groups.	Considerable input has been made to many projects being developed. Primary examples include the two Philippine horticulture programs which both have an integrated impact assessment component, fisheries projects in Vietnam and residue research in India.

Key performance indicators	Performance 2007–08
Develop a database of all past impact assessment studies and start a process of Rapid Impact assessment (RIA) studies to provide a basis for and complement Adoption and Impact Assessment Studies.	The database is nearly completed and will be in use in early 2008–09. It will require ongoing maintenance. This has been integrated with the Impact Assessment Guidelines for ACIAR which now ensures the Adoption Studies and IAs are developed on the same consistent basis. The Guidelines will be finalised in early 2008–09
Review all ACIAR fruit fly research activities and especially assess the wider regional capacity-building aspects of this work.	The report has been published in the Impact Assessment Series (IAS). This was a complex task and required input from a large range of partner countries and Australian groups.
Develop a program for assessing country wide impacts.	This was the approach adopted for the IAs for the Philippines, Indonesia and India.
Work closely with the office of Development Effectiveness (ODE) to ensure ACIAR's impact assessment work continues to be closely linked to ODE's activities.	Links have been established with ODE with the new impact assessment manager identified as the key contact. This area is still evolving because the ODE is still establishing its requirements.

## Position

The impact assessment activities of ACIAR are part of the Policy Linkage and Impact Assessment Program (PLIA). The purpose is to provide an important after-the-event dimension to the comprehensive monitoring and evaluation (M&E) processes ACIAR has had in place for many years. These M&E processes are used to ensure that ACIAR's funds are used to support priority issues and are undertaken so that objectives are achieved efficiently and effective impacts result.

The IA functions include an important accountability role in providing key stakeholders with a clear measure of the returns on the funds ACIAR invests. ACIAR continues to expand the measures of these returns to include quantification of all 'economic' impacts, that is, financial, environmental, social and capacity building/stock of knowledge. In addition the assessments are increasingly providing a basis for improving the research selection process by identifying lessons learnt from past activities and feeding them into the project development and selection process.

Emphasis is also placed on developing collaborative links with partner countries, Australian and international groups undertaking similar activities to enhance ACIAR's effectiveness in this area. These collaborative links help improve the accuracy of the information used in assessing the impacts of the research and also the effectiveness of the methodology used to quantify the returns on investment.

This year, nine impact assessment studies were undertaken. Seven were finalised and reports published. The other two are being finalised and will be published in early 2008–09.



These studies continued ACIAR's change in emphasis for IA activities of recent years. This change has been from selection of projects with expected quantifiable impact to selection based on thematic or

country programs; a stratified sampling process (where suitable); more complex aspects of ACIAR's research partnerships, especially the value of capacity building; and the potential to develop collaborative activities.

The shift to assessments with a 'program' rather than single project focus has continued. This year it took several forms ranging from country programs—in India, Indonesia and the Philippines—to discipline programs—all fisheries in Indonesia—to research theme programs—all ACIAR fruit fly research across all countries. In all, 29 projects were included in the seven impact assessments, reflecting this program focus.

The results of all studies are summarised in Table 1. These results again demonstrate that the returns on ACIAR and its partners R&D investments are very high. In total the programs and projects assessed have been shown to have returned a net present value of \$2.3 billion in welfare gains from the investments. Some of the investments have

shown extremely high rates of return with benefit to cost ratios of up to 250:1 and internal rates of return up to 210 per cent.

Importantly these high returns on investment are still being found even though there has been a shift to using sampling rather than selection based on expected high impacts. This sampling is proving to be a more complex issue when a program focus is used. This is because groups of linked projects have to be assessed together so a random sample of projects often ends up with the same set of linked projects being assessed. In addition the need to ensure sufficient time has elapsed to give concrete, measurable adoption and impact is also a constraint on random sampling. Stratification of the population to facilitate sampling has been found to be important.

We have continued to focus on quantification of capacity building impacts. The study on pig improvement in Vietnam specifically focused on this and continued to demonstrate that this is an important aspect of ACIAR's partnership modality. Two dimensions were

**Table 1: Summary of ACIAR Impact Assessment Studies for 2007–08.**

Project(s) Description	Chosen via Random/ Partial (p) Sampling	Net Present Value of Benefits (\$Am)	Benefit/ Cost Ratio	Internal Rate of Return (%)
Improved pig productivity and capacity building in Vietnam	No	1,105.5	257:1	74
Protected nutrient technology for ruminants in India	Yes (p)	113.9	121:1	42
Management of white grubs for peanuts in India	Yes (p)	6.1	26:1	29
Southern blue fin tuna management in Indonesia	Yes (p)	168.0	179:1	210
Shrimp pond remediation and management in Indonesia	Yes (p)	547.0	52:1	26
Fruit fly research program	No (all)	208.1	5:1	33
Management of internal parasites in goats in the Philippines	Yes (p)	73.0	10:1	25

again identified. The first is the contribution the capacity building makes to enhancing the impact of the technology specifically developed by the research. The second is the longer term impact the enhanced capacity has on future activities and investments; this was again shown to be a significant source of welfare gains from the R&D. Several other studies considered the capacity building impacts but it was found that if the elapsed time since completion of the project had not been long enough, it was too early to reliably identify the subsequent impacts.

## Achievements



### **Breeding and feeding pigs in Vietnam: assessment of capacity building and an update on impacts**

This study continued ACIAR's focus on separating and quantifying the capacity building aspects of ACIAR's collaborative research activities. The study updated an earlier IAS (No 17) and found that direct impacts are significantly higher than was estimated in 2001. Much of this higher impact has been due to the effect of the capacity building which ensured the improvements achieved in the initial research were maintained and expanded. In addition the study found that because of the capacity developed through the original research activity other aid donors were attracted to this area and supported further expansion of the adoption. The study concluded that part of the gains from this follow-up investment should legitimately be attributed to the capacity building investment in the ACIAR project. Overall the study found that the net present value of the benefits to all funding is \$1,988.3 million. Of this it was concluded that \$1,105.5 million could be attributed to the original ACIAR and partner funding with the balance to the other funders of subsequent development activities. The rates of return to this ACIAR activity are estimated as a benefit to cost ratio of 257:1 and an internal

rate of return of 74 per cent. However, the study also separates out the returns to capacity building which was developed in the ACIAR- and partner-funded activities. It concludes that \$422.7 million of the total \$1,988.3 million benefits are attributable to the capacity building activities. This assessment has important implications for designing projects and especially capitalising on these initial investments.



### **The impact of increasing efficiency and productivity of ruminants in India by use of protected-nutrient technology**

This impact assessment resulted from the initial review of all ACIAR-supported projects in India. It was chosen for an impact assessment because there have not been many undertaken for projects in the animal sector. It was also selected from projects which had been finished long enough to be able to measure any impacts if they have been generated. The dairy sector is an important part of agriculture in India. Productivity of dairy cows is recognised as being relatively low by international standards and feed quality and availability are identified as important contributors. The adaptation of known protected nutrient technology from Australia to different feeds available in India was the focus of the research. The assessment estimates that the net present value of the welfare gains from the impact is \$232.1 million. The returns on the R&D investment were estimated as a benefit to cost ratio of 123:1 and an internal rate of return of 44 per cent. The study notes that these estimates are probably conservative because they are based on the output of the feed manufacturing operations that were either built or were being built at the time of the assessment. Discussions with industry suggest that a substantial number of feed manufacturing operations are being considered for a wider coverage of India. If these eventuate, then the returns on the R&D funding will be significantly higher.



### **The impact of improved management of white grubs in peanut cropping systems in India**

The choice of this second impact assessment to come out of the review of ACIAR's research program in India was based on crop area and the fact that research and adoption lags were long enough for impacts to be measurable, if they exist. The primary output of the project was the technology package which not only resulted in better control of white grubs in peanuts when they are a major problem but also provided peanut farmers with a broad set of other sustainable and productivity-enhancing farming practices. The research group worked closely with NGO groups to promote this with farmers in a specific region of India where the white grub problem seemed to be a major issue. The net present value of the impacts was estimated as \$6.1 million with a strong rate of return on invested funds of a benefit to cost ratio of 6:1 and an internal rate of return of 29 per cent.



### **ACIAR Fisheries projects in Indonesia: review and impact assessment**

This study provided a review of all ACIAR-funded fisheries research in Indonesia and detailed impact assessments of two different areas of research. The review found that there has been a long term commitment to two broad areas of research. One was for captured fisheries management and the other aquaculture technologies. Consideration of all the projects in this area revealed an important sequence of research leading to impacts. In the case of captured fisheries management, the early research focused primarily on capacity building to provide partner research groups with the skills to undertake important stock assessment/ measurement work and associated fisheries management plan development skills. This capacity was found to have contributed significantly to Indonesia becoming a member

of a regional fisheries management group and to the associated access to high value markets for southern blue fin tuna caught in Indonesian waters. The study found that the net present value of the welfare gains from the investments required to achieve Indonesian membership of this regional group is \$1,100 million. The estimated share of these returns attributable to the ACIAR-supported component is \$168 million. This indicates a return on ACIAR- and partner-invested funds of a benefit to cost ratio of 179:1 and an internal rate of return of 210 per cent.

The other area of research assessed was shrimp aquaculture pond remediation. The study found that there was an integrated set of research activities which started by looking at disease problems in shrimp and, through research, found that this was due to an underlying soil management issue not diseases as was originally expected. The result has been improved management of shrimp pond development and remediation of large areas of abandoned shrimp farms. The net present value of benefits from the impact is estimated to be \$547 million with a benefit to cost ratio of 52:1 and internal rate of return of 26 per cent. While the knowledge gained about management of acid sulphate soils has much wider land development implications; time and resources did not facilitate quantification of these impacts, some of which have not taken place yet. However, these are expected to be substantial in both partner countries and Australia.



### **A review and impact assessment of ACIAR's fruit fly research partnerships — 1984–2007**

Fruit flies are a major pest in fruit-growing areas in both Australia and most of ACIAR's partner countries. ACIAR has invested in several areas of research on this pest for over 20 years. This review and impact assessment study encompassed all 17 ACIAR-funded

projects to obtain a detailed picture of the value of this significant research activity. It found a complex story with a diversity of potential impacts and a strong reliance on institutional and policy systems to be able to capitalise on the research results. The research was undertaken in 15 of our partner countries and Australia. Overall, the return on the substantial investment by ACIAR and its partners of around \$50 million is estimated to be significant with a net present value of welfare gains of \$208.1 million, a benefit to cost ratio of 5:1 and an internal rate of return of 33 per cent. However, these benefits are distributed in a complex manner between the 15 countries and Australia. Some countries such as Vietnam have received significant welfare gains, while others such as Malaysia and PNG have no clear gains yet. Much of this is due to the complexity of the effective biosecurity systems which need to be in place to facilitate the impact. On the other hand, Australia was found to have benefited significantly through biosecurity benefits receiving \$46 million of the total benefits.



### **Management of internal parasites of goats in the Philippines**

This study was one of three undertaken in collaboration with ACIAR partner organisations in the Philippines, particularly the Philippine Council for Agriculture, Forestry and Natural Resources

Research and Development (PCARRD) and Bureau of Agricultural Research (BAR). Goats are an important source of income for smallholders in the Philippines and were shown to be sustaining significant losses from internal parasites. In collaboration with Philippine and international organisations (ILRI and IFAD), ACIAR funded a program which developed a management package which effectively controlled internal parasites and enhanced goat productivity. The approach developed in this effort made substantial use of farmer participatory approaches to disseminating the management package. This also required significant resources from local organisations who worked closely with farmer groups. The study found, via an extensive survey of farmers and local extension groups, that there has been substantial adoption in the target regions. This is continuing to expand due to a strong commitment of further resources from local extension groups. The impact is significant with an estimated net present value of welfare gains of \$66 million, a benefit to cost ratio of 10:1 and an internal rate of return of 25 per cent. At this stage the project outputs have not been transferred to other regions in the Philippines but, given the success in the two regions of focus, this is likely. If this happens the returns will be much higher. Finally, this IA study only looked at the Philippine component of a larger effort. The full project covered several countries in South-East Asia and it is expected that similar results will be found in all countries.