



Dr Deborah Templeton, Manager of the Impact Assessment Unit

Measuring research impacts

AOP budgeted expenditure in 2003–04	\$327,000
Actual expenditure in 2003–04	\$439,026
Expenditure in 2002–03	\$228,685
Expenditure in 2001–02	\$333,000
Proportion of total ACIAR expenditure 2003–04	0.9%

Key performance indicators	Performance 2003–04
<ul style="list-style-type: none"> • Publish four to six assessments of the impacts of completed projects in 2003–04. A poverty reduction focus will be incorporated where possible. 	Four assessments were published, with a further four assessments completed. A poverty reduction focus was incorporated.
<ul style="list-style-type: none"> • Develop a system to enable project leaders to complete impact statements for 14 large projects that were completed in 1999–2000. 	The system has been developed with project leaders providing adoption statements.
<ul style="list-style-type: none"> • Complete a study on adoption of the results from a suite of animal health projects. 	Impact assessments for Blue Tongue Disease (IAS 23) and Foot and Mouth Disease (IAS 21) completed and published.
<ul style="list-style-type: none"> • Review ACIAR's investment in a key IARC. 	The review (in the form of an economic assessment) was completed for CIMMYT.

Position

The main aim of the Impact Assessment Unit (IAU) is to provide and analyse information on past project and expected project impacts. These impact assessments support the activities of the research areas of the Centre and enhance the Centre's public accountability, complementing the documentation and reporting of 'qualitative' project impacts. The main focus of the commissioned economic impact assessments remains measuring the dollar returns to agricultural research. Since 2002–03 much greater emphasis has been given to analysing impacts of projects on poverty reduction.

The Unit has a secondary aim of advancing methods associated with assessing research impacts, including building the capacity of ACIAR staff and project leaders to identify how agricultural research contributes to improved economic, social and environmental conditions in Australia and partner countries. During 2003–04 impact assessments which develop and/or implement 'cutting-edge' methods were commissioned. Workshops on achieving and measuring impact were also commissioned and conducted, by external consultants and the IAU Manager.

Achievements

Assessment of rodent control projects in Vietnam: Adoption and impact

Following the successful research results of two previous ACIAR-funded projects on management of rodent pests in Southeast Asia (AS1/1994/020 and AS1/1996/079), a four-year project, titled 'Managing rodents in rice-based farming systems' was commissioned. This focused on delivering



Mr Ho Van Chien, extension specialist in Vietnam, explains the concept of a community rodent trap barrier system

cost-effective, environment-friendly, benign rodent control technologies such as the community trap barrier systems (CTBS) and integrated rodent management at the village level. The ACIAR-funded project work was supported by an AusAID funded Capacity-Building for Agriculture and Rural Development (CARD) project (2000/024) aimed at enhancing Vietnam's capacity in rodent management in the Mekong Delta region using non-chemical methods. This two-year project ended in July 2002. ACIAR, in collaboration with World Vision Vietnam, also funded a program designed to facilitate farmer uptake of ACIAR project results in Binh Thuan Province.

The results of an assessment of the farm-level impact of the rodent control projects in five provinces in Vietnam (Vinh Phuc, Binh Thuan, Bac Lieu, Soc Trang, and Tien Giang) showed that the benefits from investment in rodent control projects included reduced yield losses caused by rats, a lower rodent population in project areas, reduced use of toxic rodenticide, decreased use of plastic fence to protect the whole area, and decreased rodent control costs. When CTBS use is subsidised by either donor organisations or by the government, the average (farm-level) net present value for all provinces was A\$1,565 per ha (VND 14,639,547) and the value for the average farm-level benefit–cost ratio was 22:1. This impact assessment was published in IAU's Impact Assessment Series (No. 24).

Genetics of and breeding for rust resistance in wheat in India and Pakistan

The economic benefits of the two related ACIAR-funded projects (CS1/1983/037 and CS1/1988/014) on the genetics and breeding for rust resistance in wheat were assessed. The key organisations involved in the projects were the University of Sydney, the Indian Agricultural Research Institute and the Pakistan Agricultural Research Council. The main objectives of the projects were to investigate and enhance the sources of rust resistance in wheat in India and Pakistan, and to provide training for Indian and Pakistani rust scientists at the National Wheat Rust Control Program (NWRCP) at the University of Sydney. The study has estimated the value of the training received in Australia by Indian and Pakistani scientists at \$A2.2 million per year, with India receiving the majority of the benefits.

The present value of benefits, calculated over 30 years (A\$57.2 million), is well in excess of the present value of the project costs (\$A3.3 million), giving a benefit–cost ratio for the projects of around 17:1. This result indicates that the funds invested by ACIAR in the projects on rust resistance provided a high economic return on that investment. These results are sensitive to assumptions relating to the extent and timing of the impact on R&D capacity in India and Pakistan. Even with the least optimistic assumptions, however, the projects gave a benefit–cost ratio no lower than 8:1. This impact assessment was published in IAU's Impact Assessment Series (No. 25).



Assessment of Rodent Control Projects in Vietnam: Adoption and Impact



IMPACT ASSESSMENT SERIES 24



Genetics of and breeding for rust resistance in wheat in India and Pakistan



IMPACT ASSESSMENT SERIES 25

Impact assessment of ACIAR-funded projects on grain-market reform in China

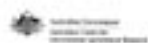
An assessment of two projects (ANRE1/1992/028 and ADP/1997/021) funded by ACIAR to present theoretical and empirical arguments to demonstrate how China would benefit from efficiency gains from less government intervention in grain marketing was commissioned. The assessment found that, if the complete body of economics research underpinning these projects has brought forward policy reform from the end of 2004 by between 3 and 6 months, the present value of benefits is estimated at between A\$40.3 million and A\$88.6 million. Assuming that the cost of this total body of research is around A\$13.5 million, the net present value for this body of research ranges from A\$27 million to A\$75 million, and the benefit:cost ratio is between 3:1 and 7:1.

On their own, the ACIAR-funded projects which formed a component of the total research are likely to advance the pace of reform less than the total body of economics research. If the ACIAR-funded projects alone bring forward policy reform from the end of 2004 by 1 month then the present value of the investment is A\$12.7 million and, given the cost of the ACIAR-funded research is approximately A\$2.7 million, the net present value for the ACIAR-funded projects is \$10 million and the benefit–cost ratio is 5:1. This impact assessment was published in ACIAR’s Impact Assessment Series (No. 26).

Acacia hybrids in Vietnam

The ACIAR-funded project ‘Hybridisation and vegetative propagation of Australian tropical acacias’ (FST/1986/030) aimed to develop methods for breeding highly productive artificial acacia hybrids and establish low-cost methods for mass vegetative propagation of hybrid clones. Although the research was done in Malaysia, Vietnam made extensive use of the techniques to develop a burgeoning plantation industry based on hybrid acacias, a clear case of ‘spillover’ benefits. The present value benefit of bringing forward the commercial release of acacia hybrids by four years in Vietnam is estimated to be A\$152 million over the whole 30-year time horizon (1988 to 2018). This is a significant return on a relatively modest research investment of A\$1.04 million. Thus, a high benefit–cost ratio of 145 and an internal rate of return (IRR) of 47 per cent are estimated. This significant return is the result of Acacia hybrids having been rapidly adopted on a commercial scale in Vietnam, and the sizeable yield advantage of the hybrids being almost double that of their parent species.

Acacia hybrid forestry has the potential to reduce poverty in those provinces where plantations are commercially viable. However, the extent to which acacia forestry will address poverty depends on the ownership structure of the plantations, the system of land allocation and the capacity of poor households to access capital, wood product markets and technology. Wealthier households are likely to benefit the most from plantation development. The poorest of the poor, even if they have access to land, generally cannot afford to invest in an activity that does not yield



Impact Assessment of
ACIAR-funded Projects on
Grain-market Reform
in China



IMPACT ASSESSMENT SERIES 26



Acacia hybrids in Vietnam



IMPACT ASSESSMENT SERIES 27

a return for 3 to 5 years. However, poorer households may still benefit from the new job opportunities generated by plantations, including tree growing, harvesting, transport and processing activities.

Water and nitrogen management in wheat-maize production on the North China Plain

The ACIAR project, 'Water and nitrogen management to increase agricultural production and improve environmental quality', investigated the efficiency of traditional rates of nitrogen and water use in wheat-maize production on the North China Plain. In present value terms, the benefits of the project were A\$219 million. They represent the economic benefits that accrue to farmers growing wheat and maize on selected areas of the North China Plain. The benefit-cost ratio is almost 77:1. A progressive project evaluation up to the end of 2003-04 assessed the net benefits at A\$24.9 million. The progressive benefit-cost ratio is about 10:1. The project will have significant poverty reduction effects. For an average sized farm input costs fall by 12 to 18 per cent. Project benefits are equivalent to an increase in income of between A\$50 and A\$109 per year for each farm.

Impact assessment of research on the biology and management of coconut crabs on Vanuatu

In June 1985, ACIAR funded a three-year project on the growth and recruitment of the coconut crab *Birgus latro* populations on Vanuatu, followed by an AusAID (then AIDAB) funded project to resurvey crab stocks and develop initial management plans for two regions. Subsequently, ACIAR funded follow-on projects in 1993 to survey and develop a stock assessment guide and extension material on coconut crabs, in 2002 to survey current stocks and review management arrangements, and in 2003 to complete the stock assessment surveys by local staff, and to develop a comprehensive management plan for the Vanuatu coconut crab fishery. The suite of projects aimed to provide a scientific foundation for improved management of the Vanuatu coconut crab resource that would benefit the Ni-Vanuatu people.

The uptake of this research was delayed, due to a lack of government resources and the necessary time for stock renewal, resulting in a present value over a 30-year period estimated to be around A\$1.4 million. The benefit-cost ratio is 2:1. If the duration of the analysis is extended to 50 years, these economic impact measures increase to a present value of A\$3.2 million, resulting in a benefit:cost ratio of 5:1.

The primary beneficiaries of this suite of research projects have been poor rural households in remote parts of Vanuatu, who benefit from the considerably larger subsistence catch. The impact of cash incomes on poverty levels also is predicted to be significant for the estimated 600 plus crab-collecting households on Vanuatu. For example, a number of collecting households in Sanma Province reported cash earnings from commercial crab harvesting of A\$2,000 to A\$2,700 per household.



Water and nitrogen management
in wheat-maize production on
the North China Plain



IMPACT ASSESSMENT SERIES 28



Impact assessment of research
on the biology and management
of coconut crabs on Vanuatu



IMPACT ASSESSMENT SERIES 29

Impact of CIMMYT research on the Australian wheat industry

An assessment of the impact of CIMMYT's research on the Australian wheat industry demonstrated that the spillover benefits in terms of productivity improvements in Australian wheat helped to offset the research-induced fall in world wheat prices. CIMMYT's success in disseminating improved varieties and technologies to both developed and especially developing countries has helped to increase global wheat production. This has resulted in a lowering of world wheat prices, including the price paid for Australian-grown wheat, by 7.4 per cent. As a consequence of the price fall, over the period 1965 to 2020, the net loss in welfare to Australia is A\$673 million. However, the position for Australia if there were no spillovers from CIMMYT research is a net loss of welfare of A\$2,099 million. Thus, the results of the analysis shows that spillover benefits from CIMMYT to Australia lead to welfare benefits totalling A\$1,425 million over that period.

In terms of the average annual welfare, for the period since 1973, when spillovers from CIMMYT research were first received in Australia, the net welfare gains for Australia from the CIMMYT spillovers have averaged A\$30 million per year. Without spillovers, CIMMYT would have reduced Australia's welfare by A\$45 million per year over that time, while the spillovers mean that there is a net reduction of only A\$14 million per year for Australia. This assessment will be published as a NSW Agriculture Economic Assessment Report.

Capacity-building workshops

A four-day research evaluation workshop was held in conjunction with the ACIAR training program in Nadi, Fiji, for project leaders in the Pacific Islands. The purpose of this workshop was to build the capacity of the attendees to evaluate the likely and actual impacts of agricultural research. At this workshop the participants were taught skills in the use of an evaluation framework to identify how research contributes to improved economic, social and environmental conditions. By including the evaluation framework in project development and delivery, the likelihood of greater impacts resulting from the project is increased. A demonstration of the DREAM model (a user-friendly tool for evaluating agricultural research and its potential impacts) was also given at the workshop.

Dr Garry Griffith from NSW Department of Primary Industries (DPI) was commissioned to deliver DREAM training workshops to ACIAR project leaders, team members and economists in NSW DPI and State Departments of Primary Industries and Agriculture. Workshops were held in Armidale in October 2003, Brisbane and Townsville in November 2003, Melbourne, Adelaide and Perth in early December 2003 and in Canberra and Sydney in May 2004. The feedback from the workshops has been very positive in terms of the usefulness of the DREAM model as a tool for estimating the returns from R&D and how it can be applied to relevant ACIAR projects.

A user-friendly tool for evaluating agricultural research



go to...

www.ifpri.org/dream.htm

...estimates the magnitude and distribution of the economic benefits of agricultural research