The Hon Alexander Downer MP
Minister for Foreign Affairs

Australia's leading role in responding to the Indian Ocean tsunami this year has highlighted the effectiveness and generosity of our aid program. The prompt, efficient and co-ordinated response from Australia has helped to save lives, rebuild communities and provide hope for countless people. It also demonstrated the best attributes of our aid strategy to vast numbers of people at home and abroad

(Source: Thirteenth Annual Statement to Parliament by the Hon. Alexander Downer, Minister for Foreign Affairs, 10 March 2005)

MEDIA RELEASE

MINISTER FOR FOREIGN AFFAIRS
ALEXANDER DOWNER

AA 05 014 **Thursday 10 March 2005**

Australia Reaffirms Commitment to Help the Region's Poor

Australia's leading role in responding to the Indian Ocean tsunami this year has highlighted the effectiveness and generosity of our aid program. The prompt, efficient and co-ordinated response from Australia has helped to save lives, rebuild communities and provide hope for countless people. It also demonstrated the best attributes of our aid strategy to vast numbers of people at home and abroad.

Australia's overseas development assistance expenditure topped $2 billion for the first time this financial year. And we have already added to that with the $1 billion Australia Indonesia Partnership for Reconstruction and Development - a five year program that is our largest ever single aid package.

As I stated in the Thirteenth Annual Statement on Australia's aid program in the Federal Parliament today, Australia's tsunami response demonstrated just how effective an integrated whole-of-government approach towards aid delivery can be, especially in times of crises. Within hours of the tsunami striking in the Indian Ocean, Australia's aid, diplomatic, police, defence and other arms of government were working seamlessly to provide urgent assistance.

In other significant efforts, Australia has drawn on expertise and capabilities across government to lead the successful Regional Assistance Mission to Solomon Islands and establish the Enhanced Cooperation Program in Papua New Guinea.

Australia's leadership role and integrated approach to helping address the region's development challenges has won international praise. The Government is committed to strengthening further the quality and relevance of Australia's aid program in order to help the region's poor.

Australia will pursue a number of interrelated policy, program and partnership initiatives to enhance the aid program, specifically:

- a closer partnership with Indonesia and the new $1 billion Australia Indonesia Partnership for Reconstruction and Development
- long-term and innovative approaches to our engagement with our immediate region
- measures to stimulate growth, including a practical analytical exercise called Pacific 2020, focussing on the long term growth prospects of the Pacific, PNG and East Timor
- tackling political governance and corruption
- addressing transnational threats centring around the implementation of Australia's $600 million HIV/AIDS commitment, and
- contributing to stability in our region.

But the Government is not resting on its laurels. This time next year I will deliver a White Paper on Australia's Aid Program which will provide a blueprint for our future aid engagements in our region. During the development of the White Paper I will access the best possible external expertise to ensure our aid effort remains at the cutting edge.

The Thirteenth Annual Statement on Australia's Aid Program is available on the AusAID website at www.ausaid.gov.au

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ACIAR Annual Report
2004–05, October 2005
ISSN 0810-8315

Distribution
This report is available through the ACIAR website (www.aciar.gov.au) or by contacting ACIAR by email (comms@aciar.gov.au) or by telephone (02 6217 0500) or facsimile (02 6217 0501) to request a hard copy.

Printing Statistics:

Copies:
3,000 copies of this Annual Report have been printed and provided to key stakeholders.

Cost:
The estimated cost of printing this report is $6.00 per copy

Design: Cecile Ferguson DTP
Printing: Union Offset Printers, Canberra
Cover Photos: Brad Collis, Coretext
Front cover: *On-farm improvement through diversification into income-generating crops is an objective of ACIAR projects in Cambodia; girls pick gerberas for the Phnom Penh flower market*
Back cover: *IRRI has been teaching rice growers to use a wire guide when planting rice as a way to maximise efficiency - an example of the simple technologies that are incrementally lifting food production in communities still dependant on rice*

Australian Government

Australian Centre for International Agricultural Research

The Hon Alexander Downer, MP
Minister for Foreign Affairs

Dear Minister

30 September 2005

ACIAR Annual Report 2004–05

On behalf of the Board of Management it is my pleasure to present to you the Annual Report of the Australian Centre for International Agricultural Research 2004–05.

The report has been prepared in accordance with section 39 of our enabling legislation—Australian Centre for International Agricultural Research Act 1982.

Consistent with section 49 of the Financial Management and Accountability Act 1997, ACIAR's Director has taken steps to ensure that the annual financial statements have been prepared in accordance with the Finance Minister's Orders. These statements, certified by the Australian National Audit Office, are presented at pages 109–143 of this Annual Report.

In presenting the Annual Report, the Board wishes to acknowledge the highly professional and dedicated way in which ACIAR staff and commissioned research organisations have sought '... to achieve more productive and sustainable agricultural systems, for the benefit of Developing Countries and Australia, through international agricultural research partnerships.'

Yours sincerely

Dr Meryl J Williams
Chair
ACIAR Board of Management

cc: The Hon Bruce Billson, MP, Parliamentary Secretary (Foreign Affairs)

ACIAR staff with Portfolio Secretary Mr Michael L'Estrange

Board resolution

The Board authorised the Chair to finalise ACIAR's Annual Report for 2004–05, taking into account the views of Board members as expressed on the draft presented at the 102nd Board meeting.

Decision 102/9
8 September 2005

The Board

Chair
Dr Meryl J Williams

Members
Mr Peter Corish
Mr Michael Taylor
Dr John Williams

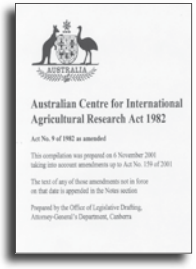
Director
Mr Peter Core

Our Functions—Section 5, ACIAR Act 1982, and Our Objectives—ACIAR's Corporate Plan 2001–06

Our Functions

Section 5 (1) – ACIAR Act 1982

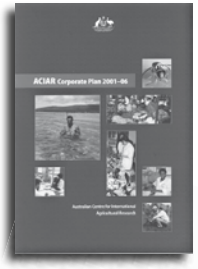
(a) Formulate programs and policies with respect to agricultural research for either or both of the following purposes:
  (i) Identifying agricultural problems of developing countries;
  (ii) Finding solutions to agricultural problems of developing countries;
(b) Commission agricultural research by persons or institutions (whether the research is to be conducted in Australia or overseas) in accordance with such programs and policies;
(c) Communicate to persons and institutions the results of such agricultural research;
(d) Establish and fund training schemes related to its research programs;
(e) Conduct and fund development activities related to its research programs; and
(f) Fund international agricultural research centres.


Australian Centre for International Agricultural Research Act 1982

Our Objectives

ACIAR's Corporate Plan 2001–06

- Be aligned with Australian Government regional priorities;
- Have flexible and realistic funding arrangements;
- Broker support beyond project life;
- Demonstrate impacts from a majority of projects;
- Align investments with partner country and Australian farmer priorities;
- Have transparent, streamlined and disseminated processes;
- Communicate effectively with selected groups;
- Provide training that meets human resource needs of targeted customers;
- Have a skilled workforce focused on tasks that enhance ACIAR outputs; and
- Achieve international recognition for its work.


ACIAR Corporate Plan 2001–06

Vision

ACIAR looks to a world where poverty has been reduced and the livelihoods of many improved through more productive and sustainable agriculture emerging from collaborative international research.

Mission

To achieve more productive and sustainable agricultural systems, for the benefit of Developing Countries and Australia, through international agricultural research partnerships.

Outcome

Agriculture in developing countries and Australia is more productive and sustainable as a result of better technologies, practices, policies and systems.


Annual Operational Plan

Contents

Landcare—the Philippines

Some key messages for ACIAR

- **ACIAR is in the service business:**
  - **with a stronger outward focused emphasis**
  - **stronger partnerships**
  - **more focused efforts to maximise impacts**
  - **better project management practices**
  - **enhanced accountability and greater transparency around our project investment portfolio.**

Achievements

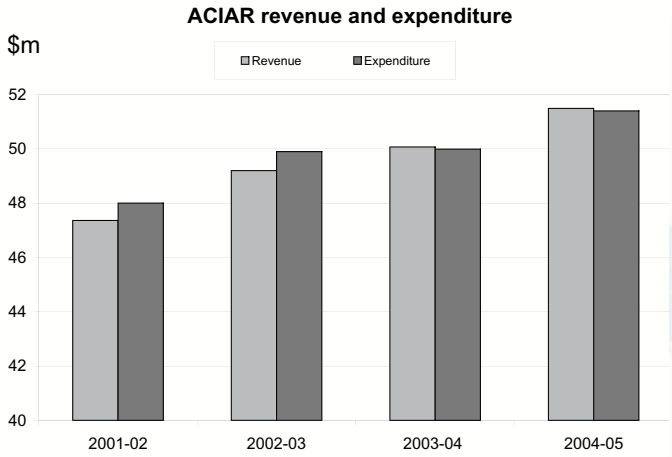
What we planned 2004–05	What we achieved 2004–05
Development of a new draft of the ACIAR Corporate Plan 2006–2010: → For discussion with stakeholders before finalisation in 2005–06	Completed. Exposure draft distributed to key stakeholders
Implementation of the Annual Operational Plan 2004–05, consistent with the Government's: → International development cooperation program → National Research Priorities	Completed. Reports against all performance indicators in this Annual Report. Separate reporting on National Research Priorities, and in this report
Review of funding arrangements for the International Agricultural Research Centres: → New arrangements effective from 1 July 2005	Completed. New arrangements commenced on 1 July 2005
Implementation of the post Uhrig Governance Framework	Awaiting Portfolio review. To be completed in 2005–06
New Certified Agreement effective from 1 August 2005	Completed. New three-year agreement certified in July 2005

Four-year snapshot

Financial ($m)	2001–02	2002–03	2003–04	2004–05
Revenue				
Appropriation	45.369	46.278	46.832	47.523
AusAID funds	1.613	2.543	3.169	3.646
Other revenue	0.394	0.381	0.073	0.322
Total	**47.376**	**49.202**	**50.074**	**51.492**
Expenditure				
Bilateral research	26.239	28.434	27.812	29.507
Multilateral research	10.461	9.827	10.181	9.984
Education and training	2.025	2.511	2.464	2.565
Other program expenditure	1.230	0.913	1.160	1.185
Salaries and corporate support[1]	8.051	8.216	8.378	8.160
Total	**48.006**	**49.901**	**49.995**	**51.401**
Operations				
Collaborative research				
Projects active in FY				
Bilateral	182	189	192	201
Multilateral	36	30	29	26
Projects started in FY				
Bilateral	38	39	38	51
Multilateral	8	5	8	7
Projects extended in FY				
Bilateral	29	30	33	41
Multilateral	8	4	5	4
Projects reviewed in FY[2]	23	26	34	24
Projects completed in FY	44	43	50	43[3]
Building capacity				
Non-project specific training courses	13	11	8	13
Fellowships:				
John Allwright Scholars in FY	40	51	50	52
Scholarships awarded in FY	20	16	6	10
John Dillon Fellows in FY[4]	n.a.	4	3	6
Our staff				
Staff – Public Service Act (FTE)	49.6	45.7	44.3	42.04
Overseas officers – Locally engaged (FTE)	19	18.8	18.8	20.5

[1] Salaries and Corporate Support excludes travel costs directly related to bilateral research expenditure.
[2] Includes both bilateral and multilateral projects.
[3] Includes both bilateral and multilateral projects concluded or due to be concluded as at 30 June 2005. Some of these projects may be extended following a review process.
[4] The John Dillon Fellowship Scheme started in 2002–03.

ACIAR 2004–05 at a glance



Project partnerships 2004–05

Overall research expenditure of approximately $38m, including on:

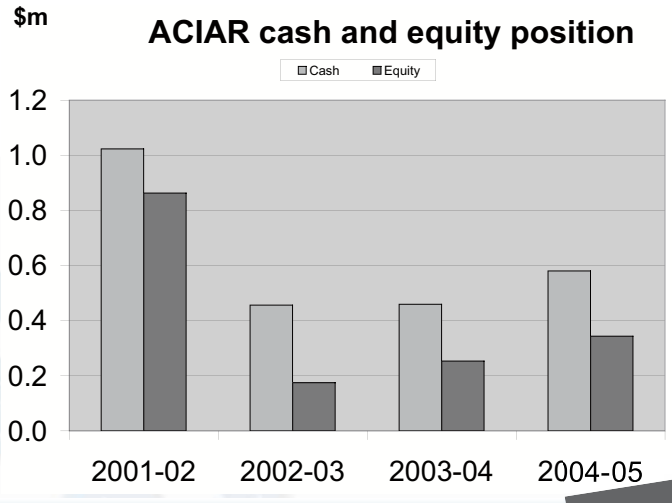
- over **220** active projects under management
- **58** new projects
- **43** completed projects.

A major joint program with AusAID aims to improve germplasm of field crops in East Timor

Eric Craswell

Whole-of-government —ACIAR an active participant

- In response to the tsunami, three workshops held and two short-term contracts commenced in July covering fishing stocks and soil salinity issues in Aceh
- A significant follow-up project, jointly with AusAID, to strengthen food security in East Timor
- Two new projects commenced in Iraq
- Continued joint funding by ACIAR and AusAID on projects in PNG and the Philippines



Next steps 2005–06 will be:

- Finalisation of the new Corporate Plan 2006–2010, consistent with key directions of forthcoming White Paper on Australia's Overseas Aid Program
- Implementation of the Annual Operational Plan 2005–06, consistent with the Government's:
  - ➢ international development cooperation program
  - ➢ National Research Priorities
- Implement additional whole-of-government research related programs for East Timor, Pakistan and Indonesia
- Provide input/advice to Government on the post Uhrig Review of ACIAR's governance framework and practices
- Complete an objective review of the benefits to Australia of ACIAR programs

Ensuring value for money

ACIAR's Impacts—An overall analysis

- In 2004–05, a systematic review was conducted of 29 impact assessment studies covering 50 individual research projects
- Just a subset of these projects has produced benefits that exceed ACIAR's entire bilateral investment to date
- This subset represents less than five per cent of all completed bilateral projects

ACIAR's impact assessments

- Five assessments published in 2004–05 all showing strong economic returns on research investment (see page viii).

ACIAR's adoption studies

- All large projects (more than A$400,000) completed in 2000–01 reviewed, with results published. Looking back at completed projects is now part of ACIAR's annual appraisal calendar.

REACHING OUT TO PARTNERS

WITH RESEARCH THAT WORKS

Eucalypt tree improvement in China

Over the last 20 years, ACIAR has funded seven projects related to the development of high-yielding eucalypt plantations in China. In total, about A$12 million has been invested in these projects since 1985, equivalent to A$18.2 million in today's dollars. The total research effort in China, including China's own projects, is estimated to generate a net present value (NPV) of A$1.3 billion over a 30-year period (1985 to 2015). Benefits exceed research costs by a ratio of 57 to 1. The investments made by ACIAR and its collaborators account for 78 per cent of total research costs, suggesting a significant proportion of benefits may be attributable to these projects.

Review of ACIAR's research on agricultural policy

Policy research should remain an important focus of ACIAR activities. A greater impact from policy practitioners is advocated along with a stronger mix of policy analyses within technical projects. ACIAR should undertake regular policy stocktakes in partner countries.

Shelf-life extension of leafy vegetables: evaluating the impacts

Improved methods to prolong shelf-life can result in savings of some 10–20 per cent of total produce. Already, project benefits have fully covered research expenses and, over a period of 30 years from 1998, the project is expected to return about A$150 million in benefits to China.

Research into conservation tillage for dryland cropping in Australia and China

For Australian wheat production, the net present value of project benefits is estimated to be A$79.5 million and the benefit-cost ratio 4.9:1. The benefits to China are estimated to be much larger than those for Australia, because of the greater volume of wheat and maize produced in China. Considering Chinese wheat production, the net present value of project benefits is estimated to be A$408.5 million and the benefit-cost ratio 25.7:1, while the values for maize production in China are A$90.6 million and 5.7:1. The estimated total economic benefits of the project are a net present value of A$578.6 million and a benefit-cost ratio of 36.3:1.

Identifying the sex pheromone of the sugarcane borer moth

The cane borer is a major pest of sugarcane in Papua New Guinea, and has caused major crop losses in the past. The project resulted in the introduction of sex-pheromone-baited traps to capture moths in flight and use information on moth numbers to schedule spraying. The estimated present value of net benefits of the research is between A$4 million and A$25 million over a 30-year time frame. With the modest cost of the overall research, this implies a benefit-cost ratio of between 46:1 and 266:1.

Message from the Chair

Dr Meryl J Williams, ACIAR Chair

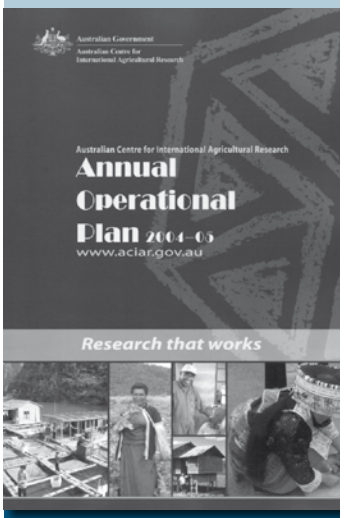
For the ACIAR Policy Advisory Council and Board of Management, the last year has been a period of consolidation. Much has been achieved by ACIAR's governing structures and by the staff of the agency. A variety of changes begun in recent years are now delivering results; these being incorporated into a new strategy that meets Australian priorities for development assistance. ACIAR, as part of the Australian overseas development assistance program and as an Australian Government agency, is also actively embedded in Australia's whole-of-government approach to programs.

The Board and Policy Advisory Council of ACIAR set the strategic directions and agenda with the ACIAR staff responsible for delivery and effective day-to-day operations. Through their respective responsibilities, the Board, Policy Advisory Council and staff have maintained an effective understanding on the directions and performance of ACIAR.

Through this Annual Report, we account for ACIAR's strategic and operational performance in 2004–05. The Report also conforms with all of ACIAR's legal reporting responsibilities.

Looking back on 2004–05

Looking back from the perspectives of the Board and Council, significant progress continued to be made on ACIAR's strategic settings. A new draft Corporate Plan was drawn up. Our current Plan runs until June 2006 and we will use 2005–06 to listen to the views of key stakeholders as the draft is refined. A key aspect of this will be to ensure that our post–2006 Corporate Plan is consistent with the White Paper on Australia's Overseas Aid Program. The White Paper, foreshadowed by the Portfolio Minister, will outline a medium-term, strategic blueprint for Australia's aid program.



At both the Board's February meeting and the Council meeting in April, priority directions and budget allocations for the Centre's Annual Operational Plan 2005–06 were developed. The Annual Operational Plan (AOP) is a key framework document for setting medium term priorities that are consistent with broader whole-of-government directions, for providing the transparency required to facilitate our partnerships both here in Australia and in the region, and for fine tuning our directions each year. This year's Annual Report benchmarks performance against the 2004–05 Plan.

Three other strategic signposts were established by the Board in 2004–05. The first was a new funding policy for the International Agricultural Research Centres (IARCs) to apply for three years, commencing from July 2005. These IARCs play a vital role in fostering pro-poor growth. Their reach is global and their primary purpose is to deliver international

ACIAR allocates $10 million to IARCs each year

public goods— research outputs that are applicable across regions and countries.

ACIAR will continue to provide the majority of those funds allocated to the IARCs (around $10m each year) on an untied basis but on the clear understanding they are to retain and strengthen IARC efforts in the Asia Pacific region. With regard to project specific funding, IARC proposals will need to be consistent with the AOP priorities and demonstrate comparative advantages above those of Australian research providers.

A strategic and ongoing issue considered by the Board in 2004–05 was the question of when ACIAR should reduce and change the nature of its engagement with partner countries. Several of these countries are growing, or have grown, rapidly as their economies become more integrated into the global economy. The primary benchmark ACIAR uses for economic development is per capita incomes. Over the recent past, ACIAR has withdrawn from Malaysia and, in the case of Thailand, is focusing on lifting the adoption rates of outputs of earlier projects rather than beginning new engagements.

During 2004–05 the position of China was considered. Per capita income in China are now close to $A2,000 and have been rising rapidly for some time. The Board has now taken the view that ACIAR's China program should focus on the sustainability agenda in western China, where there are large numbers of poor farmers, and in the Tibet Autonomous Region. Increasingly ACIAR will work with funding partners in China to increase their direct financial support to joint projects. This focusing and financial rebalancing will be progressed during 2005–06. India is developing at a similar pace, and many of the funding issues facing India mirror those in China. Again ACIAR will refine its engagement and target specific areas and aspects of agriculture to support poor farmers.

The Whole-of-Government Agenda

At the Board level, I have seen first-hand the heightened emphasis and the benefits of a whole-of-government approach to Australia's aid program. I have seen it in ACIAR's program, as a member of the Minister's Aid Advisory Council and as a member of the Core Group for the forthcoming White Paper on Australia's Overseas Aid Program.

The clearest example of this whole-of-government framework in 2004–05 was the response of Australian governments to the 26 December 2004 Indian Ocean tsunami. Emergency measures were taken by a number of Australian and State government agencies and Departments. ACIAR has commenced two major consultancies on fisheries stocks and soil salinity issues as precursors to longer-term research and development projects. These projects will support those to be initiated by major aid donors in these two important areas. ACIAR undertook three training programs in April and May 2005 which helped shape the two consultancies and build local capacity to support the delivery of these. From ACIAR's perspective, it is vital that major aid expenditures are based on sound information to maximise long-term benefits. These two tsunami consultancies are designed to promote that.

AusAID

ACIAR is part of the whole-of-government response to the tsunami

Another whole-of-government example is the Australian Government's National Research Priorities issued in December 2002. ACIAR is part of this priority framework and this Annual Report tracks our performance, in the context of Australia's aid program, against these national priorities.

Looking Forward

The 2005–06 year will see ACIAR seek to maximise the benefits flowing from its programs and its engagement on the whole-of-government agenda. At the highest level ACIAR will contribute, where appropriate, to the shaping of the forthcoming White Paper on the aid program. When it is released, ACIAR will ensure that its policies and programs are consistent with all of the paper's central tenants.

The whole-of-government agenda will continue to be centre stage in 2005–06. ACIAR has been asked to manage the largest component of a new agricultural linkages program, funded by and involving AusAID and also Austrade, between the Governments of Australia and Pakistan. We are joining together with AusAID on a major development project in East Timor that will follow up on our successful Seeds-of-Life project.

In Indonesia we will support elements of the recently announced Australia Indonesia Partnership for Reconstruction and Development. This program, being overseen at the highest levels of the Australian and Indonesian Governments, is worth $1 billion. It is an important positive to emerge from the 2004 tsunami, but will extend beyond this to help in Indonesia's ongoing development.

During 2005–06, the Portfolio Minister and Department will also review ACIAR in the context of the *Review of the Corporate Governance of Statutory Authorities and Office Holders Report*, known as the Uhrig Report. The Government's response to the Uhrig Report was released in August 2004. Review processes will examine our lines of accountability and governance structures. This examination process needs to be completed by March 2006. The Ministerial Review needs to be convinced that our governance structures generate a significant value-add over the alternatives.

In conclusion, I want to thank my fellow Board and Council members for all their support over the past year. It has been my first year as Council President and Board Chair, and it has been a privilege, both to hold those positions, and to contribute directly to enhancing the effectiveness of ACIAR operations and Australia's overall aid program.

Dr Meryl J Williams
Chair
ACIAR Board of Management

Research Program Managers at June 2005

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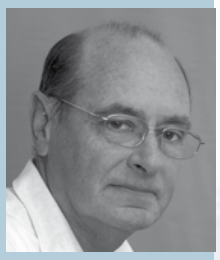

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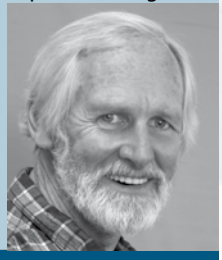

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The Director's review

Mr Peter Core, ACIAR Director

ACIAR's primary focus in 2004–05 remained the Asia Pacific region. As in the past, our key job is helping partner countries to strengthen their agricultural, fisheries and forestry sectors, enhancing the scope for broader-based, more inclusive, economic growth in these sectors.

Getting Development Right

ACIAR operates in the broader sphere of development. Stepping back from the specific ACIAR agenda there is one fact that characterises the broader development agenda—the wide income disparities that now exist between countries. This can be attributed almost entirely to differences in long term growth rates of per-capita incomes. The successes emerging in our region are really leading examples of countries that have been able to sustain broad-based growth over extended periods of time.

Broader-based, more inclusive economic growth is the key to sustainable development in partner countries

In this context, I want to reflect on why some countries in the region are now making significant progress. Clearly this sustained progress witnessed in countries like China and India, to name but two, is to a large extent driven by these countries themselves. No amount of aid is going to be effective if a country does not position itself for sustainable development. There are some basic principles like macroeconomic stability, an outward orientation, accountable government and market based incentives. Beyond that, however, much depends on the effectiveness of institutions in the partner country.

This is where the work of ACIAR intersects with the broader development agenda. As an aid focused agency, ACIAR faces the challenge of making our partnership approach more effective. We have to continue listening to our partners in order to focus and maintain these relationships over a reasonably long time frame. Above all we need to help the partner countries themselves to build their own institutional competencies.

Much depends on the effectiveness of institutions in the partner country

Australia has some of the finest agriculture-related research institutions in the world and ACIAR has been a unique instrument in facilitating the twinning of such institutions with those in our partner countries. During ACIAR's existence these countries have developed examples of excellent home-grown research institutions staffed with highly qualified researchers, in many cases trained through ACIAR-funded projects and programs.

Just as research is not an end in itself, neither is institutional effectiveness. Both are vital but real success comes with sustained broad-based growth of the agricultural, fisheries and forestry sectors, on which the majority of the poor peoples of the region depend. To achieve this, benefits of our joint research outputs must create a positive difference at the community level.

In absolute terms, the number of people in Asia living in poverty is higher than in Africa

This is why ACIAR is now working more with those institutions responsible for community development, placing a greater emphasis on participatory research methodologies. In part, this is being delivered by ensuring that our project designs include, at the outset, participants who can facilitate the adoption pathways.

Much still remains to be done. Despite the current strong international focus on Africa, many of the same problems in the Asia Pacific region have yet to be solved. In absolute terms, the number of people in Asia living in poverty is higher than in Africa. A main point of difference is that Asia is making sustained progress where as sub-Saharan Africa is not. In that context, the performance of the Pacific over the past decade has also been weak.

There are many reasons why some countries in the region are making lasting progress and these vary between countries. The mechanisms and approaches may differ when focusing beyond broad objectives to specific policies but one truism holds—"aid is only as good as the ability of a recipient's economy and government to use it prudently and productively"[1].

Hence, ACIAR's focus on partnering with those research institutions and community development organisations capable of producing results and delivering these as genuine benefits that will reach and improve the lives of end-users.

ACIAR in 2004–05

This Annual Report represents ACIAR's primary accountability tool for its performance during 2004–05. In the past financial year we were given stewardship over $50m of Australian taxpayer resources to reduce poverty and increase sustainable agriculture in our region. We have an obligation to make sure that, not only do the benefits on this investment significantly outweigh their costs, but that our reporting is open and transparent.

Our formal performance benchmark is the Annual Operational Plan for 2004–05. The Plan outlined a number of performance indicators—set out for each partner country and each program. Reports against each indicator are included in this document and in short they show ACIAR meeting most of our targets.

This is a creditable performance but it is not the whole story. No performance report is complete if it relies only on a suite of formal benchmarks. Organisations are much more dynamic and complex and the truth is that ACIAR performed strongly across a range of non-quantifiable activities during 2004–05.

We now have a first rate information sharing platform accessible to our overseas offices and all headquarter staff. Our project management systems have been upgraded and our website content is now demonstrating our commitment to transparency.

[1] *1. Birdsall, N, Rodrick, B, Subramaman, A.* How to Help Poor Countries *Foreign Affairs Vol 84, Issue 4 July/August, 2005*

www.aciar.gov.au

In 2004–05 ACIAR took significant steps in self regeneration. A number of our long term managers retired and new staff were recruited. While it is regrettable to lose committed, long-term staff, change is inevitable and brings with it opportunity. The 2005–06 year will help determine the quality of our recruitment decisions and appointments but the aim in our selection processes has been to recruit the best available people who will adopt our vision to help deliver ACIAR's objectives.

While many parts of our performance are difficult to quantify, it is appropriate to reflect on our outputs in the context of our revenue base and staff numbers. Significantly more is being achieved than was three years ago when I joined ACIAR as its Director. We are working smarter. Our revenue base has increased gradually (from $47.4m in 2001–02 to $51.5m in 2004–05). We are doing the job with fewer staff—in fact staff numbers have come down by more than 10 per cent over the past four years.

In both nominal and real terms, the costs of running ACIAR were lower in 2004–05 than in 2003–04. In a small agency like ACIAR there is a limit, but 2004–05 has continued to show a significant productivity gain across the Centre.

ACIAR and the Whole-of-Government Agenda

ACIAR is part of the Foreign Affairs and Trade Portfolio, the Australian Public Service (APS), and part of Australia's overseas aid program. The aid program involves a diverse range of Commonwealth agencies including the Australian Federal Police, the Australian Defence Forces, and the Attorney General's Department. Its oversight and hub is AusAID.

The whole–of–government response is an emerging trend of the aid program. Clearly the issues of alleviating poverty do not respect organisational boundaries—nor should they, if that means settling for a lesser result. Recent and related initiatives by the Australian Government in Papua New Guinea, the Solomon Islands and in the post-tsunami response are clear examples of whole–of–government program delivery.

This shift in approach requires greater collaboration, recognition of shared leadership, and having an organisational culture that puts a greater emphasis on collegiate skills and valuing diversity of views. ACIAR staff, now more than ever, understand the importance of working across APS organisational boundaries.

In 2004–05 we developed a joint project with the Federal Department of Environment and Heritage on greenhouse gas emissions in China. In response to the Boxing Day tsunami in Indonesia, ACIAR ran three workshops as a precursor to two projects on fisheries stocks and soil salinity issues that commenced late in 2004–05. ACIAR also worked on a number of joint activities with AusAID. These applied particularly to Papua New Guinea (PNG), the Philippines and East Timor.

Details are elsewhere in this Annual Report but I highlight East Timor. ACIAR funded a very successful project to identify superior genetic

The benefits of research in East Timor are being rolled out in a joint project with AusAID

material for their basic food staples. The benefits of this research are now being rolled out in a much larger joint ACIAR–AusAID project.

The key challenge that ACIAR staff have embraced with enthusiasm has been that ACIAR is an integral part of a whole–of–government effort to improve rural livelihoods in the Asia Pacific region.

ACIAR in 2005–06

In 2005–06 we will continue to benchmark ourselves against our Annual Operational Plan for that period. But, more than that, all of us are striving to make a more significant contribution than we did in 2004–05. It is not always an easy message but continuous change and continuous improvement will be our norm in 2005–06 and beyond.

I want to, in concluding, thank all the ACIAR staff here in Canberra and in our overseas offices for their contributions during 2004–05. It has been a great pleasure for me as a Director to work with you all and share the enthusiasm that all of us have for what ACIAR is trying to do.

Peter Core
Director

Location of the hungry

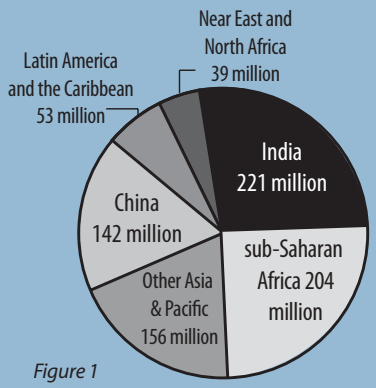


Figure 1

Where are the hungry?
Total numbers of undernourished people in the major regions of the developing world. A further 37 million undernourished live in the industrialised countries and countries in transition.

Source: UN Millenium Taskforce on Hunger, 2005

Who are the hungry?

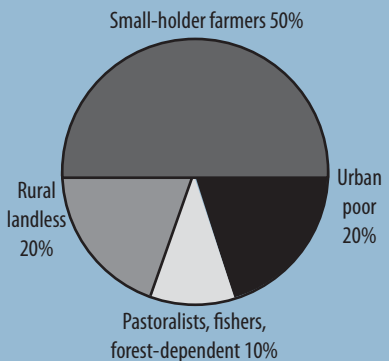


Figure 2

No single factor is responsible for this progress, instead a combination of the right approaches—policy, infrastructure, better public reserves, clean water, sanitation and educational opportunities to name a few—have driven growth. A vital factor is the increase in agricultural productivity, particularly of food insecure farmers, the majority of whom are smallholders (**see Figure 1**).

Source: UN Statistics Division, Progress towards the Millennium Development Goals, 1990–2005, Goal 1. Eradicate extreme poverty and hunger

The year in review

Regional achievements

The ACIAR Board defines target ranges for research expenditure across the regions in which projects operate. The target ranges reflect regional and country research priorities, the overall aims of Australia's aid program, and ability to deliver results through effective projects across the Asia-Pacific region and beyond. The ranges also allow more flexibility—in project development, implementation timelines and in resource allocation between regions.

Region	Board target*
Papua New Guinea and the Pacific Islands	>20%
Southeast Asia	>45%
North Asia	<15%
South Asia	<15%
Southern Africa	<5%

**During 2004–05 the ACIAR Board of Management redefined these targets.*

Country Managers and ACIAR support staff

Papua New Guinea and the Pacific

Financial year	Regional expenditure	Percentage of total bilateral expenditure	Board target as percentage of expenditure
2004–05	$6,332,358	22.5	>20%
2003–04	$5,067,418	19.8	10–20%
2002–03	$4,754,635	17.9	10–20%

ACIAR's programs cover five regions. Papua New Guinea and the Pacific Islands are grouped as one region. Outlays for the region have been rising in recent years to meet the priorities placed on the region by the Australian aid program. For the region, the Board and Minister have set an expenditure target of more than 20 per cent of our overall, annual bilateral research expenditure.

Papua New Guinea

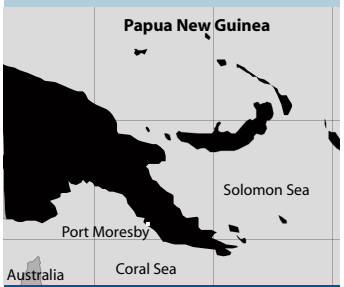
Active projects in 2004–05	38
AOP budgeted expenditure in 2004–05	$3,330,000
Actual bilateral country expenditure in 2004–05	$4,226,822
Bilateral country expenditure in 2003–04	$3,346,297
Bilateral country expenditure in 2002–03	$3,171,113

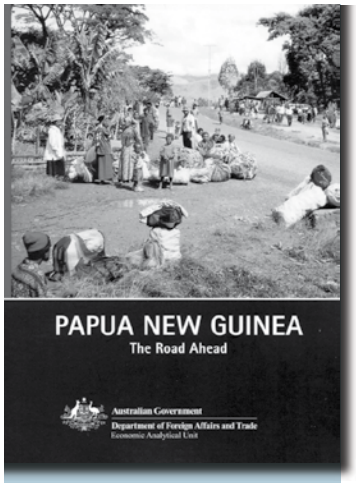
Ms Margaret Newman, ACIAR Country Manager, PNG and Solomon Islands

Key performance indicators	Performance 2004–05
• Growth in program budget for PNG compared with 2003–04	2004-05 budget at $4.2 m, compared to 2003-04 budget of $3.35 m
• Increased emphasis on projects with effective technology transfer components, including commencement of at least two new projects involving NGOs	One forestry project involves local NGO, OISCA; a second includes the Foundation for People and Community Development
• Graduation of at least two more PNG John Allwright Fellows	Two further PNG students graduated in 2004–05 through John Allwright Fellowships.
• Development of a strategy for collaboration with NAQIA on quarantine aspects of fruit flies	Strategy agreed with new collaborative project involving several PNG agencies under design, and proposed collaboration with NAQIA on: quarantine and surveillance training; and development of quarantine identification packages for fruit fly.
• Inclusion of improved growth and yield modeling tools into national forest planning processes	The draft PNG *National Reforestation Policy* includes development of a five-year national forest management programme to improve stocking. The *National Eco-forestry Policy* identifies lack of yield information as planning constraint.
• Expansion of new and more effective payment system for smallholder oil palm producers	A payment trial at Hoskins saw productivity increase by 90 per cent on blocks involved. Participants reported: utilisation of under-employed labour; greater financial security and more equal income distribution.
• Pilot testing of new vegetable supply chains from the highlands to major lowland urban population centres	PNG Fresh Produce Development Company conducted four airfreight marketing trials involving fresh produce from Eastern Highlands Province.
• Documentation of the current and potential role of peanut production in smallholder farming systems	The National Agricultural Research Institute conducted and published peanut farmers' survey covering four provinces, generating information on production, storage, utilisation, marketing systems and aflatoxin contamination.

Position

Papua New Guinea (PNG) is an important partner country for ACIAR, reflecting the long-term relationship between Australia and PNG. Australia's commitment to seeing PNG develop and prosper makes our nearest neighbour Australia's largest development partner, with a development cooperation program of more than $300 million. The size and priority given by ACIAR to its program with PNG reflects this, with funding having increased significantly in recent years. Since 1998 ACIAR and AusAID have worked together to develop and fund a small set of projects of mutual interest. To enhance the adoption of research results, ACIAR involves the private sector and NGOs in applicable projects.





ACIAR's program aims to address some of the formidable challenges in PNG's agricultural development. The country is a net food importer with high population growth. Village-based agriculture supports between 70 and 80 per cent of the population with domestic trading of fresh produce a very important source of cash incomes. ACIAR's strategy in PNG is to support applied technical and economic research to enhance smallholders' income. Root, plantation and horticulture crops, fish and forestry are focal points for research. Subjects include both export crops and domestically traded crops to generate smallholder income, and to support food security. Ensuring the continued sustainability of renewable resources, such as fisheries and forests, along with crop and livestock biosecurity are essential components of research. The PNG program also has a strong emphasis on capacity-building, both within projects and through postgraduate training for selected scientists involved in ACIAR projects.

Achievements

Studies **to improve marketing systems** have shown how to better utilise the potential of growing vegetables year-round in the unique PNG highlands environment to supply domestic markets (see box). Trial shipments are under way to assess both the strengths and weaknesses of the market chain and the level of success in meeting consumers' expectations. The productivity of the cocoa, coconut and oil palm industries has increased by boosting the participation of youth and women. Past ACIAR research helped to increase women's participation in the oil palm industry in West New Britain Province, helped by the refinement of ownership and labour payment arrangements. Women received payment for collecting fallen palm fruit through a card scheme. Now this scheme is being extended to families, using a similar card. The new project is evaluating this success to determine key lessons, revealing that **productivity increased by an average of 38 per cent** across 90 per cent of the smallholder plantation blocks participating. The findings will guide efforts to launch pilot schemes beyond the original oil palm sector, particularly for coffee and cocoa.

Brian Gunn

Tree climbers at the National Tree Seed Centre in Bulolo apply their tree climbing skills to collect seed off klinki pine.

The forestry sector is another where research is developing new markets by utilising indigenous resources. **PNG's forests have several species that are the source of valuable products**, but the country has limited capacity to exploit these sustainably, both in the smallholder and research sectors. One project is utilising essential oils found in some tree species. Villagers have long produced these oils for medicinal purposes by crushing leaves. The project has determined methods for bulk production and commercial sale, with several villages now selling to commercial markets. The additional returns have helped to build a school and improve community health through greater access to medicine and better hygiene.

Two other forestry projects are building up the capacity of the PNG Forest Research Institute—a part of the National Forest Service. One is developing planning techniques and improving databases built on information collected during project activities. The other is building capacity in the domestication of indigenous tree species. Researchers are **mapping the natural distribution of several species** and undertaking seed collection.

Improving the supply of fresh produce

Jonah Waipek, like many farmers in the South Waghi Vegetable Producers Association, is yet to reap reward from the unique potential of Papua New Guinea's highlands. Soils in the highlands are rich enough to grow vegetables year-round. In a country where food security relies on imports, tapping this potential could increase food availability and provide incomes to smallholder farmers.

The main problem facing Jonah and his colleagues is not meeting demand, but finding markets for their produce. Much of what they grow—cabbage, taro, cassava, pumpkin, sweet potato, broccoli and tomato—is simply not sold. It is only on Fridays that the Association has a regular buyer. Each week the Kubutu Mine picks up a quantity of vegetables. These are picked the previous day, but often vegetables close to being ripe are included, rather than going to waste.

ACIAR has commissioned the University of Canberra to help determine how the Association, and other groups like it, can tap into existing markets. Project leader Professor John Spriggs has discussed the factors that prevent potential buyers, such as supermarkets, from working with highland producers. The main issue raised was reliability of supply.

For Jonah and the Association's other producers the real issues are infrastructure problems, both at the village level and beyond. The lack of a cool room facility makes preserving produce very difficult, and poor communications and transport routes prohibit the growers from contacting buyers and delivering to them.

This information, together with input from extension workers, is being collated to develop a map of the marketing chains in the highlands. The result is a concept paper, designed to help key stakeholders throughout the system understand the possibilities for their industry. Already the Government and other groups with a role to play in developing markets have adopted the vision.

Work has now shifted to implementing the paper's key strategies. Jonah and his fellow farmers can look forward to tapping into markets on a more regular basis.

Geoff Allan

Smallholders sell their wares at the Yonki market, in the Eastern Highlands of PNG

Field trials to assess performance are under way, along with conservation strategies for two key species. They have also propagated some key species.

Fisheries resources are another potentially lucrative income generator. One project links in with research to increase available dietary protein and establish smallholder enterprises through **building capacity in inland pond aquaculture**. Surveys of between 300 and 400 farms, institutions and markets involved in the industry across seven provinces are in progress to develop a picture of the industry.

Sustainable management of PNG's waters is vital to their long-term health and ability to generate income for the national economy. **Two inter-related projects are focusing on the Gulf of Papua prawn fishery**. A model of this fishery integrating biological and economic data is in the latter stages of development. The related project is gathering biological data to assess the level of prawn stocks in the Gulf. The initial survey is gathering data on the characteristics of the fishery, size of catches and frequency at which vessels operate.

Geoff Allan

Tilapia cages in Yonki Dam; fish provide a valuable source of income as well as dietary protein

Two projects addressing **livestock management** are in progress. The first is examining how to reduce feed costs for broiler chickens. The industry, worth around A$50 million a year, could increase profitability, especially amongst smallholder participants, if **local feed resources could be utilised to replace imported grains**. Cassava, sweet potato and palm kernel meal have all proven suitable to meet feed requirements of chickens. The research team has also collected data for current farm settings and feed costs. The second project, also active in Indonesia and the Philippines, has developed diagnostic and control methodologies for the disease Surra. In PNG the blood sample collection protocols developed are now in use by National Agriculture and Quarantine Inspection Service staff.

Agricultural research scientists need good skills to write their results for publication to ensure dissemination of research outcomes. A project to develop graduate courses in scientific communication has helped to enhance these essential scientific skills. A complete graduate course is now available at the University of Technology, Lae. More than **200 scientists are now enrolled and 70 have graduated**. Another five universities are helping to develop the course of four units. An extension of the project will support this process.

Support for the cocoa industry is being provided in several projects. The first, completed during the year, **evaluated new approaches to drying cocoa**. Mini-box dryers and solar dryers, alternatives to kilns that cause smoke damage to cocoa, were tested and the most effective used as benchmarks in drafting revisions to PNG's cocoa regulations and related legislation. Improved cocoa varieties are now being released after quality assessment. Staff members of the PNG Cocoa and Coconut Institute have received training to help bring identified improvements to smallholders. Training manuals written for the differing needs and approaches of men and women in applying the technology are now in use by extension agencies. A recently-commenced project is working to address another research need—**improved cocoa disease control by smallholder producers**.

Improved postharvest management of another important commodity—sago—has built on project outcomes to date by **identifying conditions most likely to lead to contamination** during storage. Moist conditions in bulk storage containers can allow fermentation (caused by microbes) resulting in contamination. Researchers are now trying to identify microbes and microbial metabolites involved in fermentation and determine optimum storage periods to limit contamination.

Protecting crops from pre-harvest threats is paramount. In 2003 **an outbreak of potato late blight**, caused by *Phytophthora infestans*, significantly reduced yields. A new project is investigating this outbreak in an effort to develop effective control.

A project active in PNG, Indonesia and Australia has mapped sugarcane

pests and diseases. Research has now extended to survey key areas to build up a comprehensive picture of pest and disease distribution. The causal agent of one disease, Ramu stunt, is being investigated and **screening for resistance** against a second disease, smut, is progressing. Results have been passed to quarantine staff in all three countries. Two pests of horticultural crops—*Oribius weevil* and the red-banded mango caterpillar—are under study. The damage caused by the weevil has been determined with **treatments to exclude adult weevils from some plants resulting in price premiums** of up to 200 per cent—despite these treatments only reducing adult populations (and their damage) by half. Citrus plants fared even better—previously unprotected plants that produced no fruit started to yield again. Host plants for *Oribius* species were identified and the role of roots as food for larvae determined. Seven *Oribius* species were identified as pests in PNG. Data on the **incidence of red-banded mango caterpillar** as a pest have been collected during the past fruit season. This revealed average losses attributed to the caterpillar of around 55 per cent, also that mango cultivars are susceptible. Work continues to learn more about its lifecycle and control using pheromones and chemicals.

The use of biocontrol agents against the invasive weed *Chromolaena odorata* continues to gain momentum in PNG. Dissemination of the gall fly as a biocontrol has produced a two-fold benefit. The **fly has now been released in 11 provinces** at 70 separate sites. Populations are now established at 63 sites and in many cases have spread to infested areas within a 40 kilometre range. Increased public awareness of the weed and the need to report locations where it has taken hold has assisted its continued management and guided the release of the gall fly.

A suite of four projects aims to introduce improved varieties and better management strategies for **staple foods and income-generating crops**. Sweet potato provides around 30 per cent of total food calories in PNG. New varieties with some resistance to drought and increased yields have become available and are now being tested for their suitability prior to multiplying the best varieties for broader distribution. A similar project aimed at introducing improved peanut cultivars has introduced and tested high-quality lines from the ICRISAT collection that yield between 50 and 100 per cent above currently used varieties.

The link between magnesium (Mg) in volcanic soils and oil palm growth is being investigated, and **links established between low soil Mg levels and low tissue Mg** in adult trees. Tests to alleviate the deficiency are under way.

The use of clonal propagation of coconut to introduce improved disease-free germplasm has moved a step closer through a new protocol for raising seedlings. Scientists have successfully tested the viability of using transplants of germinated zygotic embryos (from fertilised cells). **Methods to improve the establishment and growth** of such embryos have also been developed.

Neil Hollywood

A combination solar kiln dryer developed for cocoa in PNG

R. Desmier de Chenon

A gall fly to control the spread of Chromolaena has been released widely in PNG

Coconut palms in Fiji

Pacific Island countries

Active projects in 2004–05	25
AOP budgeted expenditure in 2004–05	$2,090,000
Actual bilateral country expenditure in 2004–05	$2,105,536
Bilateral country expenditure in 2003–04	$1,721,121
Bilateral country expenditure in 2002–03	$1,583,522

Key performance indicators	Performance 2004–05
• New projects address emerging priorities agreed at formal priorities consultation held in December 2003	Seven new projects commenced in 2004–05 and two scoping studies were undertaken, each of which address agreed priorities.
• Growth in budget for Pacific Islands compared with 2000–2003 levels	Increase in Pacific budget in 2004–05 ($2.1 m) compared with 2003–04 ($ 1.72 m).
• Mini-project concept in fisheries research trialled and expanded	Mini projects concept proven with three mini-projects complete, two in progress and three at late pipeline stage.
• Initiation of three new project/contract activities in Solomon Islands	Three projects designed and implemented in Solomon Islands: sustainability and profitability of village sea cucumber fisheries, feeding village poultry; and improvement of plant protection.
• Initial sea cucumber mass release trials completed and hatchery technology transferred to several countries	Final mass release trials in progress with hatchery technology transferred to Australia and discussions progressing for PNG.
• Two short-course training activities held to address identified needs	Training workshops in fish nutrition and on taro pest identification held in Fiji.

Position

ACIAR's program with the Pacific Islands has expanded significantly in recent years. Addressing some of the major agricultural factors constraining socio-economic development will help to build a stable and economically viable Pacific region. Subsistence agriculture predominates in Pacific Island countries. Resources are limited—exports of commodities such as sugar, fruits and vegetables, spices, forestry products, and fish and marine resources are major income sources. Licensing of foreign fishing fleets to allow access to exclusive economic zones also provides revenue.

ACIAR's strategy in the Pacific addresses the significant challenges of developing markets for these products and enhancing smallholder income. Research focal points include the implications of World Trade Organization (WTO) accession, quarantine and bio-security issues and product quality, along with scales of production and the remoteness of export markets. Projects emphasise technologies appropriate to smallholders, the institutional uptake and dissemination of such technologies and the adoption of a mix of value-adding, cash-generating and marketing outcomes that also enhance sustainability. Many projects yield results that are applicable to, and disseminated across a number of countries.

Warwick Nash

The release of juvenile sea cucumbers produced in hatcheries is seen as the quickest way to rebuild stocks.

Achievements

Fishing and marine resources are vital to economies of many Pacific Island nations, while providing food and income to smallholders. ACIAR has a number of fisheries projects active in the Pacific. Several are **targeting the sustainable utilisation of species**, through aquaculture and restocking depleted fisheries. Two projects are examining methods of restoring depleted sea cucumber and trochus populations. Methods for growing tropical sea cucumber (initially focusing on sandfish) have been developed, using fine mesh nets for growing-out juveniles in earthen ponds. This has significantly improved survival rates and numbers. Tagging techniques and plastic mesh enclosures are allowing sea pens to be used to improve the management of stocking densities. **Trials releasing up to 9000 juveniles** into such pens, prior to release into ocean fisheries are helping to refine growth methods to restock wild depleted areas.

In Samoa and Vanuatu the key stakeholders in trochus fisheries have worked to consolidate research areas as Marine Protected Areas (MPAs) for trochus. This parallels the work of West Australian Aboriginal groups restocking trochus on reefs near Broome. Three **sites are now established for trochus research** in Vanuatu and three also in Samoa. In Vanuatu the MPAs have aided in stock recovery with juvenile trochus densities increasing by an average of 70 per cent over pre-brood stock release, 12 months after brood stock were released. In Samoa staff at the AusAID-funded aquaculture facility have been trained in technologies for spawning trochus, with juveniles released for the first time.

Sustainable **aquaculture of several species is under way** through mini-research and development projects undertaken as part of a broader ACIAR project also involving the Secretariat for the Pacific Community, the WorldFish Center and Queensland Department of Primary Industries and Fisheries. These mini-projects are targeting specific constraints in aquaculture industries by introducing the results of past ACIAR research. Commercial and farm-made feeds for tilapia and freshwater prawns in PNG and Fiji and testing of the viral status of black tiger prawns in Fiji are two examples. In Solomon Islands community groups are learning how to harvest post-larval coral reef fish and invertebrates for culturing and for sustainable wild capture. Already some villages have adopted the new approaches and are supplying fish and lobster to local exporters. Further extension activities are being planned, using a project-developed basic manual.

Developing black pearl aquaculture in Kiribati continues, following on from last year's successful mini-harvest of cultured pearls. Longlines that hold between 4000 and 5000 oysters have been deployed at three other locations in Kiribati to test the approach. In Tonga spat (juvenile oyster) production has continued **with hatchery production techniques now the responsibility of local staff**. A manual on culturing pearls has been developed and is now being distributed to project partners, including Solomon Islands where earlier research now supports a fledgling industry.

Warwick Nash

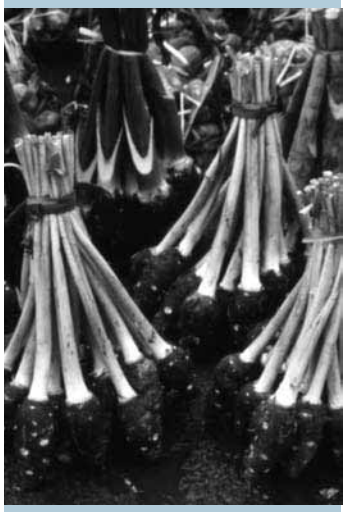
A team of four divers spent two weeks installing 12 sea pens, which allow the entry of predators, but limit the migration of sandfish juveniles

Paul Southgate

A selection from the first harvest of cultured pearls from Kiribati.

T.K. Lim

Crops provide the bulk of staple food in Pacific Island countries; stallholders at Suva markets, Fiji



T.K. Lim

Taro is an important food staple throughout the Pacific

Licence fees paid by foreign fishing vessels to Pacific Island countries for entering exclusive economic zones (EEZ) are an important income source. A project is seeking to **maximise available returns** without threatening the sustainability of fisheries. The access fees are paid for the right to fish migratory tuna stocks. A bioeconomic model has been developed and a series of stock numbers run to assess fishing fleet efforts. This is enabling more accurate assessment of achievable access fees. Information gathered on catch and location is helping to determine the level of catch within and outside the EEZs.

Crops provide the bulk of staple food in the Pacific Island countries. A project operating with support from the Secretariat of the Pacific Community (SPC) aims to develop the unique plant resources of the Pacific by **building technical capacity** and establishing common ground between nations. An associated activity has been the development and publication of a *Directory of Plant Genetic Resources in the Pacific Island Countries and Territories*, which also includes information on germplasm held outside the Pacific.

Taro is one such important food staple. Research to improve the capacity of **quarantine services to diagnose taro diseases** is complete and diagnostic tests are available for all known taro viruses. As a result taro germplasm can be virus-indexed before it is transported. Virus surveys have been conducted in Vanuatu, Samoa, American Samoa, Fiji, PNG, Solomon Islands and New Caledonia. Samples from Micronesia and the Cook Islands have also been collected and indexed. The result is a clear picture on virus distribution. PNG and Solomon Islands were found to have the most diverse taro germplasm in the region. These two countries will be the focus for collecting material to incorporate into breeding programs, including the AusAID TaroGen project.

Field trials for a control agent against taro beetle continue. A potential control agent has been identified and **a protocol for culturing the agent established and tested** to ensure its regular production. Trials are now needed to determine the effectiveness of this agent in broader-scale field settings.

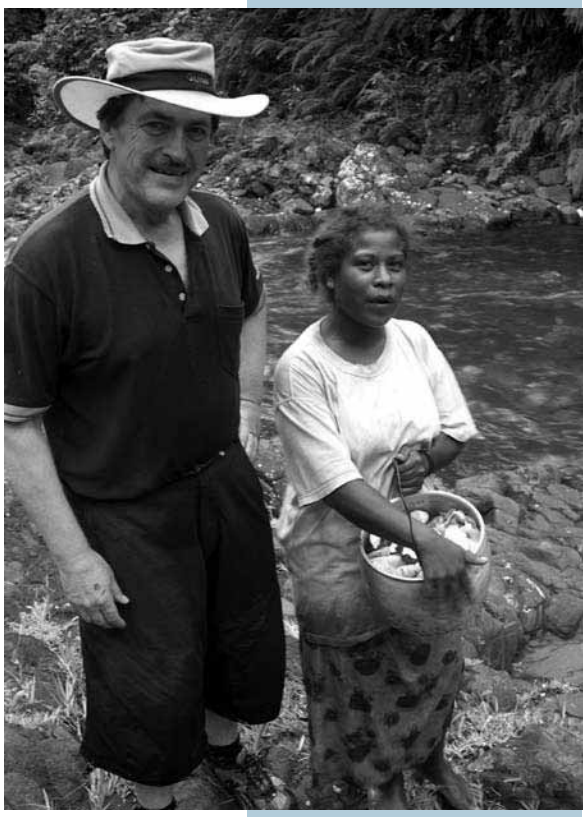
Yam is another important crop but high soil fertility and good nutrition is needed for substantial yields. The final series of field trials that examined the impacts of the addition of nitrogen and phosphorus to soils planted with yam are now concluding. **Positive responses in yields have been identified**. In one location zinc deficiency was ameliorated by application of chicken manure. And a new project commenced in Tonga to develop improved management of powdery mildew and viral diseases that have threatened the squash industry, a valuable source of export income.

Research in several Pacific Island Countries and also in PNG is studying how zoonotic diseases affect animals by reducing productivity. These

diseases can also be transferred to humans and are an increasing problem in villages in PNG and the Pacific. The antibody detection test developed last year is now available to PNG authorities for field testing and use. Surveys of affected areas have revealed that in PNG *Leptospira species* can infect humans and significantly contributes to cattle infertility. This is despite vaccination, suggesting that an optimal vaccination strategy is needed to boost its effectiveness. In Fiji the researchers determined the role of village dogs as carriers of zoonotic diseases and they are now establishing strategies to manage outbreaks by vaccinating dogs to break the transmission cycle before humans are infected.

Utilising animal waste safely and effectively has **the potential to reduce water-borne infection** and increase soil nutrient levels. Community groups involved in the project are learning to improve their environment by developing skills in managing waste and determining negative impacts on local waterways. They have also learnt to collect data to feed into the bio-economic model developed by project researchers.

Assessing groundwater resources on Kiribati has led to greater understanding of freshwater use. The depth and dimensions of the freshwater lenses on Tarawa are being determined, particularly to gauge their sustainability during drought. A **drought warning system** based on recent and historic rainfall data and water use is possible. Strategies to reduce pumping of freshwater have been developed, along with the identification of sustainable levels of water pumping during normal weather cycles. These help ensure that the transition zones that separate fresh and salt water are protected. A system to model these water dynamics, AtollScape, has also been developed.



Tony Jansen

ACIAR project leader Phil Glatz with a village woman taking food scraps to feed poultry near Buscarate in Malaita Province, Solomon Islands

Smallholders need to tap into commodities markets in order to generate incomes. In several projects scientists are exploring avenues for **sustainably exploiting horticulture and forestry resources**. In Samoa (and in Aboriginal communities in far-north Queensland's Cape York Peninsula) researchers are assessing the marketing strengths and opportunities of remote communities. Interviews with key stakeholders are revealing the nature of commodities produced and the means of developing horticulture to meet market needs. This information will help the building of extension services in both countries. A second project is also operating in far north Queensland and in Vanuatu to develop improved management of sandalwood trees—producers of valuable sandalwood oil. **Harvesting the oil** provides a valuable income source, but the resource base is declining. New

research is seeking to improve current plantations and develop better management techniques for local industries in both countries.

Roger Leakey

The canarium nut can be sustainably exploited for both food and medicinal purposes

A project now concluding in PNG and Solomon Islands has studied the potential for domesticating indigenous trees and shrubs to harvest food and other products. The canarium nut is one such resource that can be sustainably exploited for both food and medicinal purposes. Management options for harvesting the nut have been developed and refined. One issue to emerge was the importance of **managing Intellectual Property** through patents to protect the rights of traditional owners. These issues were addressed in a training course held in the Solomon Islands as part of the project.

A project to support the build-up of **forest health surveillance systems** in Fiji, Samoa, Tonga and Vanuatu is now concluding. The main focus has been training to introduce improved methods and techniques, reinforced through practical, on-the-ground survey applications. The project has raised awareness of the need to monitor forests and plantations for pest and disease evidence and outbreaks, leading to the establishment of forest health surveillance units in each country.

Two projects have examined key economic issues relating to agriculture and global trade implications in Fiji. The first has developed an econometric model of the sugar industry to determine **likely impacts of global trade** reforms. Most data have now been entered into the model, allowing the identification of improvements needed at the farm and mill level. Such information is necessary to keep the industry competitive as the global sugar market changes. The second project, also examining implications of trade reform, aims to provide policy makers with sustainable options for land-use development. A number of key policy makers from government and non-government sectors, together with land owners and tenants, participated in a workshop to begin disseminating project findings. Data gathered through both the workshop and surveys will be used to develop the economic model and draw a fuller picture of land-use changes and pressures from trade reform.

AusAid

Solomon Islands- cocoa and copra furnace.

Southeast Asia

Financial year	Regional expenditure	Percentage of total bilateral expenditure	Board target as percentage of expenditure
2004–05	$13,030,037	46.3	>45%
2003–04	$11,103,304	43.5	50–60%
2002–03	$12,713,502	47.8	50–60%

Southeast Asia is the largest of the five regions in which ACIAR conducts research activities, with eight countries involved. Indonesia is, and will remain, our largest partner, both within the region and of all partner countries. For the region, the Board and Minister have set an expenditure target of more than 45 per cent of our overall bilateral research expenditure.

Ms Chiraporn Sunpakit, ACIAR Regional Manager, Burma

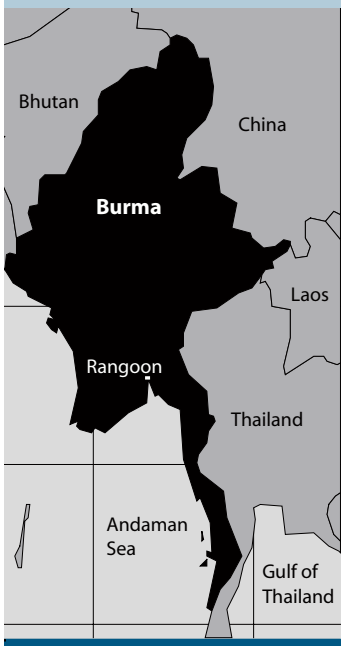
Burma

Active projects in 2004–05	2
AOP budgeted expenditure in 2004–05	$390,000
Actual bilateral country expenditure in 2004–05	$249,412
Bilateral country expenditure in 2003–04	$356,093
Bilateral country expenditure in 2002–03	$153,903

Key performance indicators	Performance 2004–05
• Understanding of the constraints of village poultry production systems in Burma	Confirmation of the importance of chicken-raising to the livelihoods of farmers in Burma and identification of young chick mortality and Newcastle disease as major constraints to rural poultry production. These findings used in several interventions for Newcastle disease vaccination and improved chick husbandry and feeding.

Alice Kenne

Farmer transporting rice straw



Position

ACIAR's program with Burma (Myanmar) is designed to improve nutrition and food security through a small number of bilateral projects. The first projects commenced in 2003. Despite limited international development cooperation prior to this time some research capacity is available through limited facilities and the presence of trained researchers. Projects address needs in agro-ecological zones similar to those found in Australia, and incorporate capacity-building and training into research activities. Burma has benefited from some spillover of past ACIAR research outcomes through FAO-supported activities.

Achievements

Two projects were active during the year, both designed to enhance food security in village-based production systems. The first is determining the constraints to **controlling Newcastle disease**, the scourge of village poultry. A vaccine developed in earlier ACIAR-supported research has been introduced via an FAO project. Surveys are now under way to evaluate the impact of vaccination. Blood collection from chickens to characterise the strains of Newcastle disease present in Burma is also under way, to determine the suitability of the ACIAR-developed vaccine.

The second project seeks to reduce the incidence of rodent pest damage to crops. This is a chronic problem estimated to reduce yields by as much as 10–15 per cent. Farmer groups are operating community-based management operations to limit rat numbers at several locations. Population studies of the major rat pest species, of which there are more than found in other countries, were undertaken in fields and villages, and a taxonomic key to identify the rodent species is in the late stages of development.

Cambodia

Ms Chiraporn Sunpakit, ACIAR Regional Manager, Cambodia

Active projects in 2004–05	9
AOP budgeted expenditure in 2004–05	$1,580,000
Actual bilateral country expenditure in 2004–05	$1,200,097
Bilateral country expenditure in 2003–04	$997,832
Bilateral country expenditure in 2002–03	$721,584

Key performance indicators	Performance 2004–05
• Growth in proportion of budget for Cambodia compared with 2003–04, and involvement of new collaborating institutions	New collaborators are Ministry of Commerce; Department of Agronomy and Agricultural Land Improvement and in Cambodian Agricultural Research Fund (CARF) projects; APHEDA, DAALI, Kompong Cham National School of Agriculture.
• Evidence of assistance in developing the capacity of the Cambodian Agricultural Research and Development Institute to carry out research on crop diversification	Several active or pipeline ACIAR projects with CARDI address legume and vegetable production, while CARDI is involved in CARF projects on maize, banana, watermelon and tomato production.
• Design and commencement of projects addressing horticulture and livestock production	Projects commenced on tomato and chilli and CARF projects on horticultural crops and cattle nutrition.
• Evidence of capacity-building in research project design and management of project leaders in Cambodian Agricultural Research Fund projects	Record number of applications received in 2004–05-round with 20 to be funded. More than 90 per cent of progress reports prepared with only limited help from international mentors.
• Appropriate linkages with AusAID Cambodia projects and provincial groups in extension of appropriate technologies from ACIAR projects	Strong linkages formed between the four ACIAR projects at CARDI and the AusAID-funded CARDI-Assistance Project. Two further projects working with provincial extension departments strengthened under the AusAID-funded Cambodia-Australia Development Cooperation Program

Position

Cambodia is a relatively new partner country for ACIAR. It has a very low per capita GDP and the predominance of low-productivity rice-based farming systems means low levels of agricultural productivity.

ACIAR now has in place a suite of projects to improve rice productivity and to begin the process of agricultural diversification. Increasing rice yields remains critical to improving food security and also incomes in Cambodia. By doing so the likelihood of farmers investing in higher-value agriculture increases. Increased rice yields per hectare will also reduce pressure to expand the area currently under cultivation to rice.

AusAID has assisted Cambodia in a number of areas and ACIAR has linked several of its projects to AusAID-supported extension. This has led to linkages with developing industries and capacity-building through training. Ensuring Cambodian researchers are brought up to date with global developments in science is a key part of project activities.

Achievements

A project to increase the productivity of rice farming in Cambodia, and also Laos, has concentrated on introducing **varieties that tolerate drought and low soil fertility** in the lowland rainfed rice systems predominant in both countries. Results from four years' experiments at eight sites revealed the importance of sufficient water availability at plant flowering to obtain good yields. Methods of screening for drought-tolerant varieties were developed. Direct seeding and nursery technologies for use in irrigated conditions during the dry season in Laos were identified and maps of agro-ecological zones drawn. The most important result was to prove the feasibility of double cropping—the growing of two rice crops or rice and mungbean crops in rotation—each year.

Adapting successful research to control rodents is also under way. Increasing productivity by limiting losses also frees labour resources from efforts devoted to rodent control. Utilising the trap barrier system (TBS) for Cambodian conditions has moved a step closer. Scientists and extension officers have received training, and **training resources have been developed**. Significant progress has been made in demonstrating the merits of the TBS to community groups involved in the project. A key element is to clarify how sharing costs can benefit the group through increased productivity of rice.

New **opportunities for income generation** arise with increased productivity of rice. The subsistence nature of rice production has limited income resulting in limited investment into more lucrative crops, both at the farm and national scale. Now researchers are assessing the suitability of lands for non-rice cropping. District-level studies are under way in three Cambodian provinces to update soil profiles as part of a wider soil profiling initiative. More than 120 profiles are available across Cambodia, of which 61 have been developed through the ACIAR project. These are being worked into a soil map for Cambodia. Five different crop types have been sown at 20 locations across the three provinces. Capability ratings matching soils to possible crops are now in development.

Brad Collis

Increasing the productivity of rice farming by introducing varieties that tolerate drought and low soil fertility

Diversifying crop choice for upland areas requires an increased knowledge amongst key stakeholders, most of who have limited experience with suitable crops. **Farming households were surveyed** to gather data on upland conditions and farming systems**. Crop production issues**

identified were a lack of suitable varieties (especially those with disease and pest resistance) for upland conditions. Several crops including soybean, peanut and corn have been planted in field experiments. Pests and diseases are being identified to allow resistant varieties to be sourced. The benefits of zero tillage in reducing cultivation and hence soil loss has been demonstrated; yields have equalled those achieved under conventional tillage. A new project supporting other crop diversification activities has recently begun.

Another potential market under study is aquaculture of freshwater species found in the Mekong Delta. The newly-initiated project, active in Vietnam and Cambodia, will identify the best feed and nutrition options for aquaculture diets based on local ingredients. A supporting project, active in the same two countries and Thailand, is assessing population dynamics and genetic structures of two important carp species found in the Mekong. Samples gathered are now being **subjected to genetic analysis**. This is revealing the spatial structures of populations within the Mekong, which will form the basis of sustainable stock management strategies.

Controlling fasciolosis (liver fluke) relies on accurate knowledge of the lifecycle of the fluke and **the distribution and spread of the disease**. A current project is updating risk maps and models built in past research. Extension officers are using geographic information systems to help in this process, substantially boosting their capacity in this field.

Cambodia's isolation from the world in recent decades significantly diminished scientific capacity. Rebuilding this is being undertaken through the Cambodian Agricultural Research Fund, **a component of the AusAID-funded Cambodian Agricultural Research and Development Institute Assistance Project**. The fund is helping to build a more competitive research sector through the provision of small research project grants. More than 20 grants were funded in 2004–05, with Cambodian scientists gaining opportunities for presenting and writing papers and identifying research problems available for further work. Courses for scientists other than those receiving grants have also been developed and presented.

Brad Collis

The trap barrier system to control rodents in rice crops is being adapted for Cambodian conditions

Brett Glencross

Aquaculture of freshwater fish found in the Mekong Delta is a potential new industry

East Timor

Active projects in 2004–05	4
AOP budgeted expenditure in 2004–05	$500,000
Actual bilateral country expenditure in 2004–05	$522,340
Bilateral country expenditure in 2003–04	$285,402
Bilateral country expenditure in 2002–03	$681,219

Key performance indicators	Performance 2004–05
• Expansion of program through initiation of two new projects in areas of high priority to East Timor	New projects on cassava varietal selection and introduction, and management of weeds of significance commenced.
• Opportunities for linkage to AusAID rural development program activities explored	Major joint program designed, co-funded by AusAID and ACIAR, for commencement early in 2005–06.
• Consolidation of crop varietal selection gains to arrive at 'best bet' varieties of maize, rice, cassava, sweet potato and peanut	Consistently higher yielding lines of each crop identified, with issues relating to the acceptability of yellow versus white maize, consistency of rice performance, bitterness of cassava, multiplication rates of sweet potato and adaptability of peanut still to be resolved.
• At least 70 per cent of the former Indonesian agriculture syllabus redesigned to specifically meet East Timorese needs	New curriculum, unit guides and workbooks have been developed for most technical subjects, with completion of some natural resource management and socioeconomic units pending.

Position

Agriculture provides a livelihood for more than 80 per cent of East Timorese and is also an important source of export income, specifically through coffee. The similarities between East Timorese and northern Australian conditions and production systems offer Australia a comparative advantage in research. ACIAR began working with East Timor in 2000, with the first projects beginning early in 2001. Current projects aim to help achieve food security, alleviate poverty and build local agricultural research capacity in the field and the laboratory.

Seeds of Life Project Team. Improved varieties of crops identified in the Seeds of Life project are now being tested in farm trials

Achievements

The *Seeds of Life* project is now in its concluding stages. A number of **improved varieties of staple food crops** have performed well in field trials in a variety of lowland and highland settings around East Timor. Varieties of sweet potato, maize, rice, peanut and cassava deemed suitable are now being tested in farmer participatory research. Wider scale production of seed for suitable varieties will follow in the *Seeds of Life 2* program. Some farmers have already gained access to improved seed through involvement in the project.

High-yielding maize varieties have been identified in the Seeds of Life project

Three sweet potato varieties yielding between 33.7 tonnes per hectare and 19.7 t/ha have been identified. These **levels of yield are the highest recorded** in East Timor. Four varieties that performed well in local conditions have been selected. Maize varieties tested during the project have yielded as high as 6 t/ha. In some areas varieties resistant to the major disease downy mildew have been trialled, resulting in yields between 4.5 and 6.5 t/ha. Many rice varieties have yielded well—the best those with resistance to stem borer. One borer-resistant variety has been well received in a number of field trials.

Two peanut varieties, one suitable for cultivation throughout the country and a second suitable for the Baucau region where iron chlorosis is widespread, have been identified. Several suitable cassava varieties, based on a combination of yield, taste and starch content, have been identified. Many of these superior varieties are being recommended to the Ministry of Agriculture, Forestry and Fisheries, for **large-scale production of material to distribute to farmers**.

Restoration of the Agriculture Faculty at the University of East Timor has been an important achievement. The project team and East Timorese University staff have **developed the greater part of a new agriculture curriculum** that will equip students to identify and solve problems in a farming systems context. This new approach, departing from the Indonesian model designed to produce graduates ready for the public service, has focused on applied on-farm research as the means to overcoming problems. Fifteen new unit outlines and a range of teaching materials have been developed.

Eric Craswell

Four varieties of sweet potato have been selected for further testing

The restored laboratory facilities at the Hera Field Station are also used by a number of foreign donors. Senior animal science students have trained more than 500 people throughout the country in aspects of livestock management. Many of the trainees are former resistance fighters provided with cattle to help them integrate back into the community.

Two new projects also commenced during the year. The first, to improve cassava production, is also active in Indonesia. The second project, focused solely on East Timor is introducing the biocontrol agents against *Chromolaena odorata* that have proven successful in PNG and Indonesia.

Rebuilding agriculture for a new country

If East Timor's agricultural sector is to reach and maintain food self-sufficiency then research capacity will need to be strengthened. Following independence in 1999 most of the infrastructure at the country's only University was destroyed and the mostly Indonesian staff returned home.

The task of rebuilding the Agriculture Faculty at the National University of East Timor fell to the Dean of the Faculty, Flavian Soares. He and his staff came together with Australian partners through an ACIAR-supported project that mobilised Australian agricultural research capacity to begin rebuilding.

Curtin University was commissioned to lead a project for the Rehabilitation of the Agriculture Faculty of the National University of East Timor. Charles Darwin University, the University of Queensland and Sydney University have also been involved.

One of the major challenges has been to shift the curriculum away from a rote-learning of information approach to developing skills and applying these in a problem-solving context. The approach was favoured by the East Timorese faculty members, who recognised the need for graduates to pass on benefits in the field.

'We started by looking at what type of graduates would be needed back in the villages. After graduation these students main role will be to train farmers, to lift our farming systems to a higher level. We are facing the need, and the opportunity, to think differently,' said Dean Soares.

Through the enthusiasm and dedication of the East Timorese and Australians involved in the project these changes are being implemented, along with the new facilities. Four hundred students are enrolled this year in agriculture courses. The first groups of graduates are now delivering training on improved livestock management in villages.

For Dean Soares life is about to change again, as he moves from teacher to student. He is soon to begin a Masters degree at the University of Queensland as part of an ACIAR-supported John Allwright Fellowship.

Australian Governor-General, His Excellency Major General Michael Jeffery, AC, CVO, MC (Retd) at the Hera Campus, National University of East Timor

Ms Amber Davidson
ACIAR Country Manager, Indonesia

Indonesia

Active projects in 2004–05	47
AOP budgeted expenditure in 2004–05	$4,280,000
Actual bilateral country expenditure in 2004-05	$4,433,281
Bilateral country expenditure in 2003–04	$3,689,481
Bilateral country expenditure in 2002–03	$4,062,457

Key performance indicators	Performance 2004–05
• Maintenance of a strong program (at least as large as in 2003–04) and project pipeline	Nine new projects commenced in 2004–05 with actual bilateral expenditure representing $4.4 m compared with $3.7 m in 2003–04.
• More than two-thirds of projects initiated in 2004–05 have a significant eastern Indonesian component	Nineteen projects commenced or designed in 2004–05 of which 14 have a significant eastern Indonesia component.
• Identification of projects with potential for application as pilot community projects	Cluster of suitable projects identified with direct participation of farmer groups in pilot community development activities—for rodent management, Bali cattle production, crop–livestock systems, banana disease management, finfish cage culture and community forestry.
• At least six new fisheries projects implemented	Six projects commenced in 2004–05—mudcrab diets, finfish hatchery, cage culture planning, tuna stock management, shrimp health and live reef fish trade
• Development of an integrated modeling toolkit for assessing risks and benefits of improved forage production in mixed crop-livestock farming systems	Integrated Analysis Tool allows operators to choose a number of cropping, forage and livestock options and assess important drivers used by local staff.
• Confirmation that the Indonesian Thin Tail Sheep has a strong resistance to Giant Liver Fluke	The project has produced evidence of a gene strongly linked to the expression of *Haemonchus contortus* resistance and three possible gene loci for resistance to *Fasciola gigantica* in Thin Tail Sheep.
• Identification of optimum support systems for community forestry development in eastern Indonesia	Potential role identified for partnership agreements between forest growers and the timber industry to achieve social and economic equity and advance reforestation by private landholders in eastern Indonesia.
• Permanent raised beds established as a viable alternative to highly labour-intensive tillage systems on vertisol soils in Lombok	Raised beds offer acceptable rice yields and the potential for water harvesting to substantially increase yields of soybeans grown after rice, and allow high-value vegetable crops to be grown during the dry season.

Position

Indonesia's proximity and strategic importance to Australia mean that ACIAR's investment in Indonesia is the Centre's largest bilateral program. ACIAR's Indonesian program has a strong emphasis on agricultural research to increase incomes of farmers and fishers, particularly in eastern Indonesia. Major focal points are improving the production systems for crops, livestock and forestry. Research also aims to add value to agricultural produce and to develop export markets through an emphasis on farming as agribusiness.

With most research capacity located on the island of Java, many ACIAR projects are designed to create linkages between these institutes and regional researchers. This includes linkages to regional adaptive research agencies and planning authorities. Such institutions have a key role to play in the continued conservation of the resource base for agriculture, with projects aiming to support their activities. Projects targeting crop and livestock production systems improvement as well as forestry and fishery production and resource conservation also connect with development policy projects, including those examining the implications of decentralisation.

Since the publication of the ACIAR 2004–05 Annual Operational Plan (against which this document reports) parts of Aceh and Northern Sumatra were devastated by the December 2004 tsunami. ACIAR is working in conjunction with AusAID, other Australian Government agencies and the international research and donor communities to help rehabilitate affected areas. Additional funding to support training and project development was allocated for 2004–05.

Bali cattle—capable of producing a 95 per cent weaning rate

Achievements

Livestock production systems in eastern Indonesia rely on Bali cattle. **Traditional farming practices** have been conservative, producing low-weight animals that do not attract premium market prices. Feed availability and good nutrition have been limited, impacting on calving levels and creating much of the conservatism in animal management. A suite of projects designed to boost incomes by addressing these problems has developed practical approaches to overcoming three of the major constraints to production. The first project developed **new management approaches and technologies to lift low animal production rates**, through earlier weaning and appropriate replacement feed. Calving rates increased from 60 per cent of cows to 90 per cent and calf mortality levels also fell. These approaches have been developed into 'best-bet' packages that are being extended to villagers (see box).

A second project identified improved forage species and feed options for adoption in crop-livestock systems. Eleven grass species and 18 legume varieties were evaluated for a range of factors including yield and quality. Researchers found that the use of mucuna as a dry-season crop in lowland areas, when combined with the utilisation of napier grass planted in and around villages assured a year-round feed supply. This in turn **promotes animal growth and income from sales**. The project also introduced Indonesian partners to computer-based modelling and simulations. **Building on computer modelling for Sumbawa and Sulawesi** was the focus of a third, related project. Using the Australian developed APSIM computer model as a starting point the researchers gathered information to build integrated models of crop-livestock systems. This model, a first for Indonesia, is now being extended to farmers as part of a new project.

Cattle management to deliver more beef

Kelebuh village in Indonesia's Lombok province is able to take advantage of the country's rising demand for beef for the first time. The village, like thousands of others in eastern Indonesia, rears Bali cattle. But traditional husbandry practices have reflected the role played by these cattle, as a source of draught power and a status symbol. Cattle are also a source of savings, being sold to fund major purchases.

The idea of rearing cattle to tap into growing demand for beef is relatively new. Traditional husbandry practices do not aim to fatten animals for quick sale, and have contributed to low levels of fertility. As a result farmers have not adapted to changes in production. Increasing numbers of cattle being sold without increasing numbers being bred resulted in declining numbers.

ACIAR-funded studies have addressed these issues, adapting husbandry techniques to cater for the changing circumstances. This research has introduced improved husbandry that has seen calf mortality fall and a reduction in the weaning time of young animals.

Before project scientists began working with farmers in Kelebuh's communal 'kandung' calves were born every 18 to 24 months. Since the villagers adopted the improved weaning practices and began controlled mating, calves are now being born every year. In effect these simple approaches have doubled calf production.

With a young heifer or bull being valued at around $200, close to the annual income for many villagers, this increased production offers them a chance to double their income.

Complementing this has been improvements in hygiene and nutrition that have accelerated the rates of growth. Improved feed options using both local ingredients and new forages have also been introduced. The quicker the animal can be fattened the sooner it can be sold. Cattle are now reaching market weight in half the time compared with that taken prior to the project's intervention.

These improvements have now been developed into a series of 'best-bet' options to be extended to other villages. Such options will be adapted to fit their systems, based on the farmers' ideas of what is practical, as was the case at Kelebuh. Lombok's regional Government is also supporting the spread of the project through low-cost loans to help villagers buy cattle.

Most farmers rely on cut and carry forage to feed their animals

A second major focus of livestock research relates to the management and control of animal diseases in a series of production systems. Several animal health issues and diseases, notably liver fluke, Surra and Jembrana in cattle and Gumboro in poultry are prevalent in Indonesia, and each is the subject of an ACIAR research project.

Control of animal diseases is an important focus of livestock research in Indonesia

Liver fluke is a parasite that debilitates animals and lowers productivity, reducing milk output and meat quality and curtailing animal use for draught power. These parasites dwell in the liver of animals causing the infections that result in such problems. Natural **genetic immunity to the two main parasites** has been identified in Indonesian thin tailed sheep. These sheep express specific gene products that kill parasites. Identifying the genes and mechanisms responsible has confirmed thin tailed sheep do have natural resistance to liver fluke parasites and a list of candidate genes for DNA marking has been compiled. The mechanisms by which these genes attack fluke parasites have been determined. An ELISA test for early diagnosis of parasites has also been developed.

Researchers have confirmed the efficacy of a treatment for the disease Surra (caused by *Trypanosoma evansi*). This was **achieved by testing different isolates** of *T. evansi* for their sensitivity to the cymerlase treatment. The project, also active in PNG and the Philippines, has determined the role of parasites in increasing the likelihood of Surra infection in carabao in the Philippines. Targeting treatment in carabao, vital to the farming enterprises of smallholders in Mindanao, will be undertaken.

A vaccine for **Jembrana disease in Bali cattle** is a step closer. The project team successfully developed two vaccine constructs using recombinant virus proteins. When used as vaccines the constructs **have proven to reduce virus loads** in laboratory testing and will now be tested for further development. A pilot trial on live animals produced some positive results and demonstrated the need to optimise vaccine administration methods. Continued development of a vaccine for infectious bursal disease (Gumboro) is in progress. Indonesia has strains of the disease that cause high mortality and reduce chicken productivity and numbers. A potential vaccine to provide immunity to chickens and which can be passed on to offspring has been successfully tested in field trials.

New projects seek to improve the fertility of soils

Improving cropping systems is the subject of several projects to introduce better management techniques, both for yield gains and **to control pests and disease**. Two projects seek to improve the fertility of soils. The first is using the APSIM computer simulation models to develop integrated management of nutrients in a range of tropical cropping systems. Most smallholder farmers in the tropics have used available organic inputs such as manure. The project has built a new APSIM module that includes phosphorus interactions with nitrogen in soils, how these impact on crop yields and the implications for manure management and which is now being used to model crop rotations and design field experiments. The

second project has demonstrated the feasibility of using raised beds on vertisol soils to grow high-value vegetables. Vertisol soils are clay based and require considerable effort to till in preparation for cropping. Raised beds combined with zero tillage can grow crops in both wet and dry seasons. Forty-five farmers involved in the project are now growing long bean crops to supply to PT BISI, a multinational seed company. **Good rice yields can be achieved on raised beds**, opening the possibility of rotating rice and vegetable crops to ensure food supply and additional income. Improved management of rice and soybean, the traditional staple crops in West Nusa Tenggara, has also been demonstrated to increase yields of both crops.

Another Lombok-based project is developing an improved understanding of rainfall probabilities to assist farmers and policy makers better manage irrigated agriculture. Irrigation is supplied by diverting rainfed streams, causing environmental issues relating to these waterways. Training is under way for key Government agencies to enable them to utilise rainfall forecasting software for use in **seasonal forecasting** for more appropriate irrigation management policy.

Another soil management project aims to control fungal diseases in soils. Researchers examined four important crops—cloves, vanilla, maize and sago. All suffer losses attributed to soil-borne fungi. The causal agent for 'clove decline', the main disease of cloves, has now been taxonomically described, and wounds in trees, made by a trunk borer and mechanical injury, determined as the main entry point for this agent. Management **strategies based on these findings, plus control of other insects, are now in place**. A pathogen of vanilla, causing stem and root rot, was also linked to infection through tree wounds, with disease management strategies developed and disseminated.

Agronomic management to reduce aflatoxin in peanut is being refined. Aflatoxins, which can be fatal to humans and livestock, can be reduced through good crop and postharvest management practices. Controlling **the fungus *Aspergillus flavus* that produces aflatoxin** buildup is the main focus of biocontrol strategies being developed. These increase the inoculum levels of non-toxic *Aspergillus* strains in soils, which can replace the toxic strains. An ELISA test for detecting aflatoxin has been adopted by Indonesian project partners and is now in regular use. Disease control options for banana farmers are now under investigation in a newly commissioned project. Field management strategies such as biocontrol agents against banana wilt diseases are an initial research focal point.

Two projects are developing management strategies against pests that limit fruit and vegetable production. The first, newly commenced, is examining the **range and distribution of fruit fly species** in Indonesia. The leaf miner *Liriomyza huidobrensis* has been the subject of a project soon to conclude. Taxonomic studies have revealed that *L. huidobrensis* and *L. sativae* are the two main *Liriomyza* pest species attacking vegetable

T.K. Lim

A new project will develop management strategies against fruit fly – a major pest of many fruit and vegetable crops

crops. Researchers have determined their distribution and confirmed that pesticides are of limited value as a control. Natural enemies—parasitoids and a predatory fly—have been identified as potential control options.

Development of **new agribusinesses and markets** and support for value-adding to existing produce is a priority across a range of projects. In the forestry sector three projects are addressing sustainable resource utilisation. A recently commissioned project is examining the value of partnership agreements between the timber industry and smallholder plantation owners. Known as out-grower schemes, such agreements can promote reforestation by engaging smallholders and others. The project is assessing these schemes in Indonesia and Australia and developing recommendations to improve existing arrangements.

Addressing the problem of heart rot in *Acacia mangium* could substantially boost profitability in the industry. Heart rot is difficult to detect prior to harvesting trees, but **its presence limits the use of timber in high-value products**. A new and rapid survey method for heart rot detection in plantations has been developed and is now in the early stages of use. The third project has been examining alternatives to the traditional slash-and-burn agriculture practiced in Indonesia and elsewhere. A key component in engendering new practices is income generation through sustainable resource utilisation. The use of coffee trees in limiting erosion and providing a potential income source is one such example. Researchers have determined strategies to enhance growth of coffee trees and limit soil erosion, and have mapped erosion susceptibility. This will be used by local government planning agencies.

High demand is placing increasing pressure on Indonesian fisheries

Increasing fish supply to meet rising demand without increasing pressure on wild resources, and **producing better quality produce is the focus** of a suite of projects. A new project is examining improvements in the live reef fish trade valued at around $350 million. The project, also operating in Fiji, is examining the marketing chains in each country for possible improvements. Two recently commissioned projects are supporting aquaculture of tropical and marine finfish species. Past ACIAR research with grouper species has introduced improved rearing techniques that are now being independently adopted by backyard hatcheries in parts of Bali and are spreading to other parts of Indonesia. Lessons from this research are applicable for **lifting the survival rates of other high-value species**. Improved hatchery production of juveniles and matching dietary nutritional needs to locally accessible resources is limiting the reliance on taking young fish from the wild. An associated project intends to improve management of finfish aquaculture in ocean cages by developing a better understanding of the environmental impacts from unconsumed feed. Researchers in Indonesia and Vietnam are building management tools to help authorities identify the best areas for cage-based aquaculture.

A similar project is examining **cage-based aquaculture in inland reservoirs**, a practice widespread throughout Indonesia. Overstocking

and unsuitable management practices are resulting in fish kills that can spread to wild, uncaged fish populations. Surveys of cage culture activities and practices together with wild populations assessments are under way at three large reservoirs. These follow on from a census that drew a clear picture of the size of both aquaculture and wild capture industries for these same reservoirs.

Maintaining the viability of current aquaculture industries has been the focus of research that **revealed acidity as a key cause of fish losses** in earthen ponds in parts of Indonesia. Acids were released into waters after acid sulfate soils were excavated. Simple, cost-effective techniques were developed to restore degraded acidic ponds and to limit acidification of newly constructed ponds. Low and high technology solutions to identifying acid sulfate soils, through detection of certain plant species found in these soils and through use of geographic information system mapping, have also been developed, along with alternative production systems for degraded ponds.

Harvesting of honey from mobile bee hives provides valuable income to smallholders. In recent years two parasitic mites that attack bees and reduce hive productivity have dampened their returns. Refinements to controls using formic acid in modified hives have **reduced mite levels by between 80 and 90 per cent**, compared to more expensive commercial chemical controls that achieve 95 per cent reductions. Simple tests for the presence of the two mites, and other potential pests, have also been developed with further refinement under way.

Two projects are supporting smallholders engaged in contract farming and microfinance arrangements—the first, examining contract arrangements between smallholders and agribusiness firms, has developed classifications based on markets, commodities and contract interactions between the two parties. Information gathered is now being **used to determine appropriate policy interventions** from Government to support all parties. These policies are examining both macro and micro level reforms. The second project has trained more than 400 people involved in microfinancing to help build a more sustainable system. The key findings that emerged relate to the role played by intermediaries and how changes can increase savings and credit facilities in villages.

Helping Government institutions manage policy related to the **sustainable expansion of agricultural sectors** is the aim of studies under way in the Indonesian and Thai economies. The studies focus on technical changes and their impacts. Researchers in both countries have begun to gather data relating to industry sectors, which are now being fed into economic models. A separate project is mapping constraints within a single agricultural sector—the coconut sector in North Sulawesi—to determine the impacts on the broader regional economy and appropriate policies to reform the industry.

Improved fish rearing techniques developed in ACIAR projects are being adopted by backyard hatcheries in Bali

Craig Proctor

To achieve sustainability in Indonesia's tuna fishery, effective catch monitoring is essential

Decentralising from a central Government system to state and provincial management presents challenges that are the subject of research focused on the forestry sector. The rapid speed at which decentralisation was introduced in 1999 revealed problems with provincial capacity in policy formulation. Case studies examining these and related issues have been drafted and used to write briefs on 'hot topics' emerging from the reform process.

Interactions between policy and resource management are the subject of a suite of projects covering fisheries, forestry and land and water management. Following on from past research **a project is bringing together resource managers** of the Sulawesi (Celebes) Sea, which lies between the Philippines and Indonesia. Overfishing of the Sea is likely to cause fisheries to collapse, and reviews of catch data, legislation in each country and international obligations are under way to enhance cooperative approaches to monitoring and controls of fishing in the Sea. Another fishing resource, sharks and rays in Indian Ocean waters, is shared by Indonesian and Australian fishing fleets. ACIAR-supported research is gathering data on catch levels to help implement a sustainable National Plan of Action in Indonesia to address overfishing as a long-term threat.

Carbon sequestration refers to the holding of carbon deposits, such as forests, from being harvested. To encourage less carbon release into the atmosphere a scheme to use carbon credits in return for the sequestration of deposits has been developed. Credits can be gained from planting new trees or reducing the rate of deforestation. The difficulty has been **transferring these credits into payments to smallholders** as compensation for not harvesting forest resources. Indonesian agroforestry systems have been analysed to determine sequestration potential, profitability and employment options. Bio-economic modelling of these systems and an assessment of reforestation projects involving smallholders in west Java are helping to develop policy to support future reforestation schemes.

Fire is used in parts of Indonesia as a land management tool, particularly in agroforestry systems. Ensuring **more judicious use of fire** requires policies relevant to current conditions. Past and current fire-use patterns across several sites in Indonesia have been described, using both satellite imaging and mapping. Information-gathering on the social and economic impacts and benefits is also in progress. These data are being used to introduce appropriate land and forestry management changes to participating groups, and to reinforce policy development. Modelling water catchment changes caused by agroforestry is under way in Indonesia and Thailand. The model is revealing that industries such as horticulture, when practiced intensively, contribute to pesticides entering waterways.

ACIAR projects are supporting smallholders engaged in contract farming and microfinance arrangements

The December 2004 tsunami

ACIAR's response to the tsunami of December 2004 has focused on Indonesia. Governments of other tsunami-affected countries have not asked for specific assistance in rehabilitating agricultural sectors. The **assistance provided by ACIAR commenced almost immediately**, and is expected to continue for several years.

Initial work focused on establishing the best and most suitable areas for both training and project development. ACIAR staff met with Indonesian agricultural, forestry and fisheries research institutes in Java and Sumatra to assess where Australian expertise could provide the most substantial help.

Two areas of focus have emerged: first, rehabilitating fisheries management and aquaculture industries, and second, dealing with soil salinity and crop production in lands inundated by sea water and now covered in sediments.

The first two projects—initiated as contracts to expedite project design and implementation—were under way at 30 June. One relates to the management of soil fertility for restoring cropping in tsunami-affected areas of Nanggroe Aceh Darussalam Province; the other is examining fisheries rehabilitation in tsunami-affected Indonesia—through assessment of community needs and resource status.

Agricultural and fisheries R&D and extension staff in Aceh and other parts of northern Sumatra identified the need to re-focus their efforts on the immediate needs of local people. Training of these staff, using Australian and Indonesian expertise at intact facilities in other parts of Indonesia, was identified as a priority to bolster local contributions to the long-term relief effort.

Between April and June 2005 three training workshops tackled soil management and aquaculture issues. Initial training courses have used a 'train the trainer' approach, helping scientists and technicians who will be leading others. Courses are designed to ensure everyone is working from the same base, to establish common ground before undertaking research.

Workshops have covered basic field and laboratory techniques—including how to use, calibrate and maintain soil monitoring equipment, remediate degraded aquaculture ponds and manage aquaculture threats such as disease outbreaks.

Courses have been held outside tsunami-affected areas, with participants learning and practising the skills they would need to take back to Aceh and use in the field with farmers. Some time was spent in Aceh conducting field-based training and planning future work.

ACIAR's activities are designed to help farmers establish productive livelihoods as soon as possible. Although life is far from normal, agriculture remains the main income source for many people in the region—even as rebuilding goes on.

AusAID

ACIAR has developed new activities to assist farmers in the tsunami ravaged areas of Indonesia.

Ms Chiraporn Sunpakit, ACIAR Regional Manager, Laos

Laos

Active projects in 2004–05	9
AOP budgeted expenditure in 2004–05	$910,000
Actual bilateral country expenditure in 2004–05	$824,152
Bilateral country expenditure in 2003–04	$714,519
Bilateral country expenditure in 2002–03	$545,329

Key performance indicators	Performance 2004–05
• Through consultation with Lao partners and international donors, develop a new strategy for ACIAR's investment in Laos for the 2005–08 period	Lao Agriculture and Forestry researchers and CGIAR partners involved in development of medium term strategy with priority areas identified.
• Capacity development of the National Agricultural and Forestry Extension Service (NAFES) through involvement in projects and training activities	NAFES are major partner in project and training activities associated with participatory research and extension for shifting cultivation farming systems.
• Evidence of farmer uptake of new rice varieties and fertiliser systems in central Laos	The District Agriculture and Forestry Service and World Vision Laos introduced new crop varieties and fertiliser systems to 10 villages in each of three districts in Savannakhet province.
• Better vaccine delivery systems for Classical Swine Fever for improving pig production for rural communities	The vaccine provided was ineffective in field tests; inappropriate storage was found to be the problem. Trials of new storage protocols are under way.

Position

ACIAR's program in Laos uses a small number of projects to focus on major policy and technical issues concerning shifting cultivation, livestock health, crop production and forest production. Laos has been a partner since 1992. Research initiatives, such as those aimed at crop and livestock farming system diversification complement activities undertaken by donor programs of other countries. During 2004–05 ACIAR has developed a small number of projects to expand the program.

Achievements

Development of new approaches to farming in Laos is the focus of several projects. Shifting cultivation dominates upland farming systems in Laos, while in lowland areas rainfed rice cropping is the main agricultural activity. Increasing population, land degradation and resource scarcity are combining to build pressure on shifting cultivation systems. ACIAR is supporting broader initiatives to introduce sustainable changes by working with national research and extension staff. An archive about methodologies tested in Laos and elsewhere in Southeast Asia has been established out of literature searches and records of past experiences relating to upland farming. It has been used to develop case studies for use when introducing forages as the basis for improved animal production into new villages. A methodology **to encourage formation of farmer groups** has been developed to carry out this work. Involving Lao staff has substantially built local capacity in extension activities with villagers.

A similar project, run through World Vision, is also delivering new technologies, this time in lowland areas. Farmers in selected central and southern districts are being schooled in planting dry-season crops, including peanuts and green beans. Although in early stages of activity some **adoption has already taken place**, with the first harvests delivering an additional income of more than US$400 per family across participating groups.

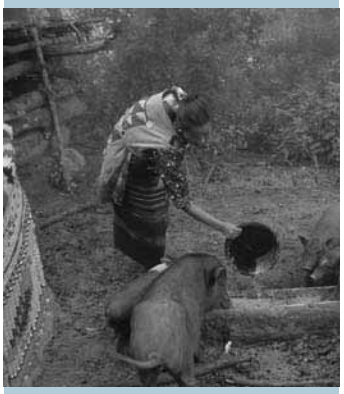
Research originally begun in Thailand to adapt low-chill temperate stone fruits suitable for local conditions is now being extended into Laos and Vietnam. Both countries have **small temperate stone fruit industries** in need of technical support. Using lessons learnt during the Thai component of the project a range of plum, peach, nectarine, pear and persimmon varieties that are better adapted to Lao and Vietnamese conditions have been introduced. Six arboreta, at two sites in Laos and four in Vietnam, have been established. Of the 1300 trees imported and planted to test their suitability to local conditions 70 per cent are still alive.

A major constraint to animal production in Laos is poor animal health caused by livestock diseases. Classical Swine Fever (CSF) and Foot and Mouth Disease (FMD) are particular problems, specifically CSF in village pig systems. A project to develop and implement **vaccination at the village level** is developing a rapid diagnostic test to support the delivery of vaccines. An ELISA test suited to local laboratory conditions has been developed and some initial testing undertaken. Evidence suggests that the CSF vaccine currently used may not be as effective as first believed. A problem relating to the transportation of currently used vaccines has been identified and is being resolved.

Farmers in upland areas have traditionally run very few cattle and buffalo. The gradual **introduction of forage species has broadened the choice** of quality feed options, leading to an increase in animal numbers. To enhance this uptake ACIAR extended a project on forages operating in China, to test lines for their suitability to Lao conditions. Trials have revealed that the acidic nature of most upland soils does not suit lucerne varieties, but that other soils found in valleys and limestone hilltops are likely to be better suited.

The suitability of plant species to alleviate saline soils is the subject of another project, operating in Thailand but with some activities in Laos. Dryland salinity has the potential to become a problem in Laos. Modelling groundwater movements and interactions with saline areas in the Champhone catchment is now complete. Now researchers are determining appropriate management approaches, such as planting **saline-tolerant tree, shrub and grass species**. Salinity risk areas are being mapped and monitored, with the research also having significant applications in Thailand and Australia.

Lao fish market



Hmong mother feeding pigs

Forages to improve crop-livestock systems

Ban Ta village in the uplands of Laos is participating in the International Center for Tropical Agriculture Forages and Livestock Systems Project (FLSP). ACIAR has three projects that link into the FLSP, each helping introduce more sustainable farming systems.

For farmers like Pa Heu the changes have been simple but highly effective. By planting suitable forage species around her fish pond, where the plants benefit from good soil moisture, year round growth is possible.

The forages are then hand-fed to the single buffalo Pa Heu owns. Such is the rate of the animal's growth when fed quality forages that it will soon be sold, with the profit likely to be more than US$50. Some of this money will go to purchasing a cheaper, malnourished animal. This too will then be hand-fed and fattened for sale.

One of the success factors in this approach is its simplicity. Rather than changing existing systems at a number of levels, or completely, the FLSP approach has been to introduce adaptations that can deliver positive results.

Traditionally livestock were left to graze in nearby jungles and were at the mercy of predators—both animal and human. Now these animals are kept closer to villages and are fed a superior diet than that available through wild-grazing. The benefits are not just to buffalo—pigs fed sweet potato and legumes as part of their diets are also exhibiting improved health and growth.

For Ban Ta's farmers, and others in villages participating in the FLSP, these changes have helped them take the step from subsistence farming to income generation.

Farmers take part in a field visit to learn about new forage varieties.

Joanne Millar

Philippines

Active projects in 2004–05	31
AOP budgeted expenditure in 2004–05	$2,410,000
Actual bilateral country expenditure in 2004–05	$2,295,395
Bilateral country expenditure in 2003–04	$1,852,285
Bilateral country expenditure in 2002–03	$2,948,986

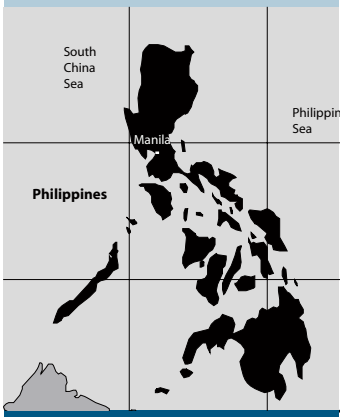
Ms Cecilia Honrado, ACIAR Country Manager, Philippines

Key performance indicators	Performance 2004–05
• Evidence of strengthening of the interface between research and extension teams in at least four projects	Two new postharvest technology mango projects both specifically include provincial agriculturists, who also participated in project planning meetings and in project management training.
• New natural resource management projects underpinned by design processes that involve end-users of the research and address their needs	Two natural resource management projects commenced that include partnerships with end-users in Landcare and smallholder tree farming projects with a further two projects under design.
• Commencement of two ACIAR–AusAID jointly funded initiatives in response to undertakings made by Prime Minister Howard in July 2003	Three projects—integrated pest management and supply chain improvement for mangoes, sustaining and growing landcare systems, and postharvest diseases of subtropical and tropical fruit commenced.
• Improved tree nursery production practices implemented in private and community nurseries in Leyte	A demonstration forestry seedling nursery developed, providing useful training and extension facility for community-based forestry programs in Leyte; two demonstration tree farms established for field trials.
• Prospects for using biofertilisation to reduce pathogen damage to vegetables assessed	Volatile compounds released from *Brassica* tissues following processing proven very effective in suppression of two important pests and diseases of solanaceous vegetables.
• Evaluation of the ripening characteristics of glasshouse-grown genetically modified papaya fruit	Evaluation of glasshouse-grown genetically modified papaya fruit undertaken and report submitted to ACIAR.
• Increased awareness and cooperation on illegal, unreported and unregulated fishing issues at a national policy level	Strong local leadership and good cooperation between relevant key agencies has contributed to excellent progress, with IUU audit of Philippines fisheries well advanced.
• Evidence of farmer uptake of grouper and mudcrab hatchery technologies	Limited uptake of mudcrab and marine finfish hatchery technologies to date, in part due to recent institutional restructuring at SEAFDEC.

Position

The Philippines and ACIAR have been partners in project activities since 1983. The current program emphasises market access and international competitiveness in the emerging global trade environment. Improving export-quality commodities grown from aquaculture, plant and livestock industries and reducing contaminants are focal points. Project scientists are also working within agricultural systems, particularly those practiced by smallholders, to enhance their profitability and sustainability.

Geographically the program has shifted, focusing on the poorer areas of Mindanao and the Visayas. Such projects link the expertise in Manila and Los Baños to these outlying areas, and aim to increase the limited



A new ACIAR project is investigating integrated pest management approaches in the mango industry.

adoption of past project results. Increasing the involvement of end-users of the research is included in project design. ACIAR's program is also aligned with Australian Government initiatives to encourage closer technical cooperation in agriculture, focusing on postharvest improvements to reduce losses.

Achievements

Improving market access by improving supply chains is being addressed in two projects. The first is examining the mango industry from two aspects: the efficacy of integrated pest management approaches (the pests are the leading cause of fruit losses), and improvements in the supply chain. An analysis of this chain is under way and **areas for practical improvements of benefit to smallholders** are being identified. The efficiency of the agribusiness supply chain for smallholder vegetable producers on Mindanao has been scoped revealing the need for cooperatives to work together to change farming practices to produce improved quality vegetables. Those adopting the new approaches have reported increased returns, and there is an improved awareness of the role of market-driven agriculture to aid development in Mindanao.

A small suite of projects is addressing barriers to delivering high-quality commodities to markets, by developing improved germplasm. The first project is examining **cryo-preservation of seeds of several tropical fruit species**—including mango, papaya, citrus, persimmon and litchi—to overcome storage losses. The ability to 'revive' preserved lines using micropropagation and plantlet regeneration has been proven for several of the fruits. A second project is addressing control of papaya ringspot virus (PRS-V) by identifying resistant papaya varieties. Promising genotypes are being tested in glasshouse and field trials. Five molecular markers for genes linked to resistance have been found and two genetically sequenced.

Ripening of some tropical fruit is not uniform, resulting in losses due to harvest timing and postharvest factors. Two **genes involved in the ripening processes for papaya** have been identified in past research and have now been isolated and cloned. These genes have been introduced into papaya varieties with low expression, or activation of ripening, delaying this process in fruit still on trees. Several lines with the two genes incorporated have been developed and are being screened for ripening characteristics. This work may also apply for mangoes. Another project on mango is **seeking to reduce postharvest disease losses**. Mango and some other fruit trees have natural defences against such diseases during growth, but these do not always transfer to fruit after harvesting. Identifying these natural defences is helping the project team assess pre- and postharvest treatments. Several preharvest treatments have been developed and now tested by farmer groups. **Sprays to activate natural defences** after fruit harvesting are also being trialled, with initial results proving positive for banana.

A similar approach is being used to target the enzyme responsible for the development of **blackheart in pineapples**. Blackheart, difficult to detect prior to cutting a pineapple, renders fruit inedible. A reliable transformation technique to introduce resistant genes has now been refined and patented. This reliability has helped in the production of more than 5000 plants for field evaluation. The role of cold temperatures and fruit wounds in inducing blackheart have also been confirmed and are being considered for pre- and postharvest management strategies.

Assisting **smallholder livestock producers** maximise available returns is helping industry efficiency. Poultry producers farming chickens and ducks require improved management approaches if they are to remain competitive in an environment of growing domestic demand and increased trade liberalisation. A picture of supply chains in both sectors has emerged and researchers have identified where Government policy can assist in introducing improvements. Researchers are introducing the Australian-developed BREEDPLAN software to aid in the genetic improvement of ruminant species (buffalo, cattle and goat). The software helps identify lines for incorporation into breeding programs, based on desired traits. A range of information specific to local conditions has been collected and introduced into software for Philippine requirements and is now in use.

Soil pathogens, such as bacterial wilt and root knot, have been controlled through fumigation with methyl bromide. This can lead to environmental damage and residual amounts of the fumigant on **produce in horticulture and vegetable production**. Sustainable management of these pathogens in smallholder vegetable systems is being tested using biofumigation (relying on the volatile compounds from Brassica plants) as a substitute for methyl bromide. Relevant agencies and institutions are learning about the improved management options through the project extension.

Three related projects are developing improved management options for pesticide and insecticide residues. Agricultural practices that contribute to residue mobilisation have been determined, including rates of soil absorption. A pesticide impact rating index has been adapted to these parameters and is now in use. Pesticide residues are also a problem on horticultural produce. Enzyme bio-remediation that degrades the toxic residues is being utilised. Trials of application protocols for the enzyme on eggplants and tomatoes found that up to **60 per cent of such residues can be removed within a one hour application**.

The final project in this suite involves integrated weed management to reduce herbicide use. The reliance of rice farming systems on herbicides to control weeds has encouraged the development of resistance in some weed species, leading to increased spraying and higher levels of residues in soils and water. An integrated weed management package has significantly lowered herbicide applications in initial field trials.

Better plant propagating techniques were developed under the ACIAR Philippines–Australia landcare program

Management of vegetable crops can reduce herbicide use

A project following on from the successful facilitation of Landcare group development has recently begun with the aim of assessing the factors behind adoption. It is also examining how to use these factors in **the expansion of Landcare beyond Mindanao** where initial activities were located. A related project, now concluded, examined community involvement in reforestation schemes to combat substantial land clearing on the island of Leyte. Researchers identified significant factors restricting forestry development.

Problems with **community nursery propagation practices** were identified and improved practices developed. A recently commissioned project is furthering these findings. Better management practices for **natural stands of bamboo** are being developed. These are introducing changes to harvesting, as a start to changing attitudes from short-term gain to longer-term income generation.

Water resources are being managed more sustainably on Bohol Island after assessing the extent of runoff and erosion. Using geographic information systems to gather data has allowed an evaluation of the extent to which erosion is caused by the six main cropping activities. Information on the socio-economic and policy issues that contribute to erosion-causing practices has also been collected, and researchers have demonstrated the need to integrate appropriate technologies into local planning and farming practices.

Assessment of wild stocks of another important resource—the giant freshwater prawn—has been completed in the Philippines and Indonesia. This revealed an extensive natural range throughout much of the Asia-Pacific region and significant natural diversity. Two **major population sets exist**, divided by a biogeographical line, with many diverse genotypes. Most farmed prawns originate from the same genetic group, so this information offers the possibility of introducing more diversity into stocks for culturing.

Two projects are building research capacity in key Philippine institutions. Extension services have become degraded and decentralised in the Philippines over the last three decades. How this process has affected farmers is being assessed through a dual approach to **determine the strengths and weaknesses of current public and private extension services** and how these have impacted on farmer decision-making. The aim is to find solutions by developing a framework that matches extension approaches to farmer needs. Another project is examining how seasonal climate forecasting could aid agricultural planners and participants, by developing an understanding of the factors constraining its introduction and applicability. As a start researchers wish to identify these factors, to help determine if the forecasting techniques suit the Philippines.

Thailand

Ms Chiraporn Sunpakit, ACIAR Regional Manager, Thailand

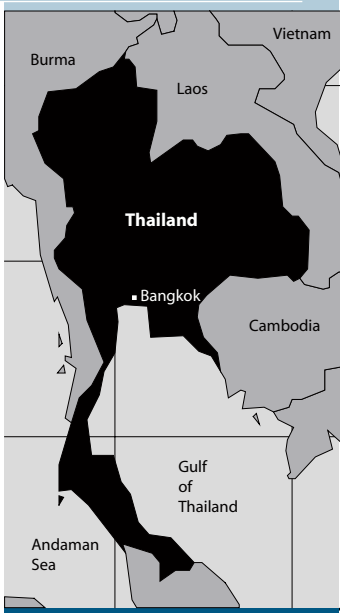
Active projects in 2004–05	16
AOP budgeted expenditure in 2004–05	$570,000
Actual bilateral country expenditure in 2004–05	$522,291
Bilateral country expenditure in 2003–04	$1,102,630
Bilateral country expenditure in 2002–03	$1,090,643

Key performance indicators	Performance 2004–05
• All new projects under development are focusing on implementation of results of earlier ACIAR projects	All three projects under development emphasise results of earlier projects on livestock breeding strategies, shrimp health and domesticating high-value trees.
• Evidence of increased farmer involvement in projects on soil fertility management, crop production and fisheries	Scale out of two World Vision–ACIAR collaborative projects on vegetable production and aquaculture beyond original provinces and districts; involvement of farmer groups near Khon Kaen in project on alleviation of acidity from legume production on acid soils.
• Linkages through collaboration and training of Thai scientists to counterparts in neighbouring countries in at least three projects	Collaboration with Lao and Cambodian scientists in Mekong fish stock mapping; with Indonesian scientists on shrimp diseases and on water yield and quality in agroforestry systems with Lao and Vietnamese counterparts on low-chill fruit production with Malaysian, Philippines and Vietnamese scientists on fruit germplasm conservation.
• Effectiveness of on-farm shrimp disease control and management programs validated and extension through farmer networks initiated	Disease control programs validated on-farm, Thai language extension materials produced and widely disseminated to farmer groups and government extension centres.
• Enhanced Thai capacity in sanitary and phytosanitary policy issues	Capacity developed to enable use of WTO-compatible mechanisms for monitoring food safety standards, particularly in fisheries and processed vegetable products.

Position

Thailand was an original ACIAR project partner and has been involved in more than 100 successful projects since 1983. In recent years growth in the Thai economy, and with it research capacity, has seen a shift in the focus of project activities. The emphasis now is on seeking greater implementation of the results of past projects, both within and outside Thailand, by smallholder farmers. A secondary focus is on the management of natural resources, particularly in north and northeast Thailand.

New activities in Thailand bring the results of research to smallholders. How to harness Thai research capacity to assist neighbouring countries is considered in project design. This includes recent policy and technical projects relating to trade issues such as sanitary and phytosanitary regulations and the impacts of trade reform and liberalisation on the Thai economy. Several projects involving Thai institutions are reported under other countries.



Achievements

World Vision–ACIAR partnership has worked to disseminate research results in Laos, Vietnam and Thailand. In Thailand's Songkla Basin vegetable farmers have **adopted new management methods** that significantly reduce chemical runoff. Past research had identified chemical applications as the cause of water contamination. By replacing chemicals with diluted chicken manure and introducing other management improvements farmers have grown quality crops that are marketed as being pesticide-free. This attracts a price premium. A second Thai component has introduced low-cost feeds based on locally available ingredients to aquaculture farmers in Udon Thani and Surin provinces. Farmers learnt the technology to prepare feeds at a community centre and the Thai Department of Agriculture provided follow-up technical support. By replacing commercial feeds with locally produced ingredients profit margins have increased. As a result of seeing this success more than 600 farmers have now established aquaculture ponds.

The final Thai component has extended the introduction of low-chill stone fruit species to northern highland areas. More than 18,000 seedlings distributed as part of the World Vision project to 1000 farmers have been planted. Current activities focus on **improved technology for growing healthy trees** and examining intercropping options to generate income until the trees mature.

Crop losses caused by metal contamination in peri-urban areas are common in parts of Thailand and elsewhere in Asia. Rice, potato and peanut, along with other crops, are often rejected at market by buyers who suspect possible contamination. Thai scientists are involved with Vietnamese counterparts in an ACIAR project addressing this issue. The **collaborative approach is developing improved soil data** collection and assessment techniques. Geographic information systems were used to map heavy metals in crop lands in both countries, and the scientists now know the level of background metals found in soils. Tests of ecotoxicity, to assess environmental effects from metals, have been refined and improved.

Improving the quality of shrimp produced through aquaculture is the subject of another ACIAR project, operating in Thailand and Indonesia. The project has validated farm-level controls for diseases of shrimp and extended these and past research findings to farmers for field trials, achieving **a greater than 70 per cent success rate** in ensuring good harvests.

Managing soil salinity and acidification has been addressed in two projects now concluding. Regional **modelling of land and water use in saline areas** of Thailand's northeast has demonstrated current practices do not maximise environmental benefits or economic returns. This information is now being directed to policy makers. A second project, also in China, has tested legume-based production systems in acidic soils.

Methods of alleviating acidification have been developed and include addressing nitrogen depletion.

Other research issues relate to trade globalisation and development and their impacts at the macro and micro levels. An examination of agribusinesses involved in commodity exports to **determine the impact of sanitary and phytosanitary trade regulations** is under way. A number of issues relating to the acceptance or refusal of food exports by potential buyers and the implications of these for domestic industries have been assessed. Case studies examining these implications in individual agribusiness firms have been developed. This information is now being disseminated to researchers and policy makers in India and Thailand. At the farm level the impact of men working off-farm or migrating to urban areas in search of work has resulted in lost productivity. The project is examining strategies and options to deliver appropriate technologies for women left to run farms.

Bob Nissen

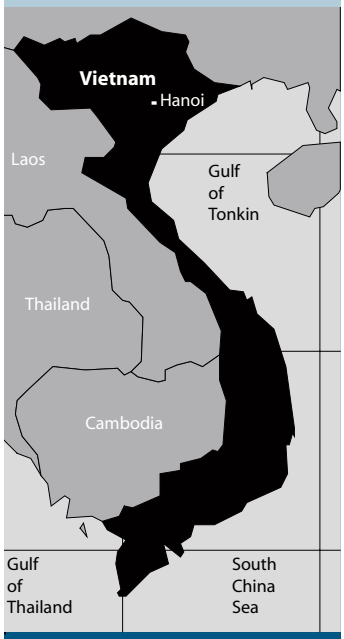
Low-chill stone fruit varieties are being distributed to farmers in the northern highlands of Thailand

Ms Misha Coleman, ACIAR Country Manager, Vietnam

Vietnam

Active projects in 2004–05	34
AOP budgeted expenditure in 2004–05	$3,060,000
Actual bilateral country expenditure in 2004–05	$2,983,069
Bilateral country expenditure in 2003–04	$2,069,638
Bilateral country expenditure in 2002–03	$2,212,809

Key performance indicators	Performance 2004–05
• Four new projects start with a central Vietnam focus, linking with research institutes in major cities	Four projects—groundwater access, crop diseases, mud crab diets and tropical spiny lobster—commenced.
• Strong linkages between three projects on fruit production, crop protection and postharvest technologies in the NW highlands of Vietnam	Linkages between four projects: low-chill fruit production, postharvest disease and quality management, strengthening market information, and managing pest fruit flies.
• Consolidation of AusAID-funded training of Vietnamese scientists in fish nutrition through the implementation of two new ACIAR projects	New projects with a nutrition focus, mud crab diets and tropical spiny lobster aquaculture to consolidate earlier capacity-building in fish nutrition under the AusAID-CARD program.
• Advancement of hybrid acacia technologies into routine tree breeding programs	Hybrid acacia plantations in Vietnam now stand at over 150,000 hectares, with deployment of hybrids based on technologies initially developed with ACIAR support.
• Use of pesticide and mycotoxin tests for export crop certification	Certification methods used to match the requirement of the import partner, with two tests accepted for export certification, and officially recommended by Vietnamese Government.
• Extension of disease management strategies for durians to farmers	National distribution of the phosphonate treatment introduced controls of phytophthora in durian, with cultivation of 6000 ha by 4500 farmers, half of whom are hill tribe minorities.



Position

ACIAR's program in Vietnam has evolved since it first began in 1993, when the focus was on capacity-building through project activities. Training still remains an important facet of activities, but the main focus of the program has shifted to practical farmer help and policy impacts. A secondary component of project design is building linkages from the main research centres in Ho Chi Minh City and Hanoi to regional institutes. The new regional focus for these activities is central Vietnam, particularly central coastal regions. Projects in Vietnam may also involve other Mekong countries, covering issues that are common to these partners.

The strategic emphasis of the current program involves boosting smallholder incomes through research that targets crop and livestock diversification within existing farming systems. Improving market access is a focus, including strengthening the comparative advantages Vietnam has in some commodities for both domestic and export supply. Options for the development of rural agricultural enterprises, including efficiencies of cooperative production and marketing, are being addressed. Improved natural resource management and their sustainable utilisation are also research focal points.

Achievements

Rice and maize are the two most important crops in Vietnam, with soybean the third largest crop. A major factor inhibiting increased yields is poorly adapted soybean lines. A dual approach **has been adopted to introduce improved lines**, focusing on testing varieties for their suitability to local conditions and examining agronomic practices. Varieties tolerant to major environmental stresses and adapted to local conditions (such as the shorter sunlight duration during the winter months when soybean is planted) were introduced. The best of these are expected to be released commercially.

Three other projects are also **addressing improvements to cropping systems**. A newly commenced project is examining the use of growth-promoting rhizobacteria for use in improving nutrient availability in soils used for rice cropping. The first year of research introduced more sustainable soil management practices in upland areas. Soil sampling was undertaken at two sites and the major constraints, including acidic soil types, were identified. An acidification risk map has been developed and is being used to build up soil capability classification, to help choose the appropriate crop and best management techniques. These data are being fed into the Vietnam soils component of the World Vision–ACIAR joint project to **extend the results of past research to farmer groups**. World Vision is also extending the trap barrier system technology to communes to help reduce rice losses from rodents, and is changing fertiliser and soil management practices in peanut cropping.

Control of huanglongbing (Asian citrus greening disease), a major constraint to citrus production, is being investigated. The project, operating in Indonesia and Vietnam, is developing management strategies for both the disease and its vector, the Asian citrus psyllid. Initial results indicate **oil sprays as a likely control option**. Research to control several significant diseases of citrus continues, with collections being screened to identify resistant varieties. Trials have been established at several locations.

Fruit fly management is vital to effective horticulture and vegetable cropping. Collection of species across the country has so far confirmed that nine species of fruit fly are major pests. Training of 290 extension staff from the Provincial Plant Protection Department has equipped them to introduce improved management options to 4400 farmers across Vietnam. This includes managing insecticide-laced protein baits manufactured by a local brewery from brewery waste. More than 5000 **copies of farmer extension materials have been circulated** to other Vietnamese research agencies. Trials involving farmer groups have successfully suppressed fruit fly populations to where fruit damage is minimal.

A joint Thai–Vietnamese collaboration is examining the use of green ants to control mango pests. Introductions of the green weaver ant continue

to be trialled, and **low and high technology solutions** to controlling the ant's aggression during fruit harvesting are under development. An added bonus of using weaver ants in combination with low-impact, targeted chemicals as part of an integrated pest management package is improved fruit quality and marketability.

Better controls against fruit flies pay off

Vietnam's smallholder fruit farmers have become accustomed to losing significant parts of their crops to fruit flies. In northern Vietnam up to 95 per cent of each year's peach crop is destroyed by these pests and Barbados cherry production in the Mekong delta region can suffer similar losses.

Long Thuan, a village in southern Vietnam's cherry growing region, has been part of a trial of and approach to managing fruit flies that is new to Vietnam—the use of treated brewery waste, which with addition of an insecticide attracts and kills pest species. Since beginning the trial returns on sales of cherries have doubled.

For villagers like those in Long Thuan and other areas of the Barbados cherry growing district of Go Cong, the only proven deterrent was chemical cover sprays, capable of causing problems for human health and the environment. These sprays often kill other invertebrates including natural predators of the fruit fly.

The use of brewery waste is a far more environmentally friendly approach. Treating this waste with heat and enzymes converts it to a protein that is highly attractive to fruit flies. The protein is diluted with water and a miniscule amount of insecticide added. The mixture is applied as a spot spray on a tree, sufficient to attract and kill flies.

The experts from Griffith University's International Centre for Management of Pest Fruit Flies helped to devise a survey to determine the local fly species and susceptible host fruit species. This was important for getting the formulation of the bait right and to develop an understanding of the target host crops.

Once this was achieved the research team sought partners to build a processing plant. BASF (formerly Aventis) provided funding channelled through the Crawford Fund, and Fosters Vietnam agreed to build a plant to process the waste into protein baits. The plant opened in April 2004 and since then fruit farmers in Vietnam have been trialling the bait.

Since they began the trials Long Thuan's farmers have benefited from dramatic rises in yields—and incomes. Where previously farmers sold their cherries through a middleman for only 1500 VND/kg, they are now able to obtain 3000 VND/kg. Even greater increases in yields and incomes have been reported by minority Hmong peach farmers using the new protein bait spray technology in northern Vietnam's Moc Chau district.

Fosters Vietnam has built a plant to process brewery waste into fruit fly attractant baits

Two livestock systems are under study. Pig meat production in Vietnam relies on smallholder farmers who supply 80 per cent of all pigs. High feed costs reduce profit margins and encourage smallholders to feed pigs less than optimal diets. The **lack of protein restricts growth rates** and increases time to sale. A range of feedstuffs is being assembled and analysed for positive nutritional components and also for negative elements such as toxins. One foodstuff under investigation is rubber

seed meal with initial indications suggesting appropriate agronomic management of selected varieties could provide a low-cost feed option and produce better rubber seed oil for sale. A similar approach to increasing beef production in central Vietnam is also being undertaken, with researchers aiming to characterise the nutritive value of a variety of feed options.

A project operating across a number of countries, including Vietnam, is collating a range of **information on tropical forage species** for use in a computer-based selection tool known as SoFT—Selection of Forages for the Tropics. It will make it easier to choose suitable forages for smallholder and larger-scale agricultural systems from the120 major forage species. SoFT was launched at the International Grassland Congress in June 2005.

A project to introduce Vietnamese researchers to market analysis aims to strengthen the flow of information between Government agencies, market chains and ultimately smallholders. **Pig, vegetable and fruit canning market chains** and information channels are being examined and described. Vietnamese researchers are improving their skills in these areas by undertaking data collection, case studies and analysis. This information is being provided to the Ministry of Agriculture and Rural Development's Information Centre for Agriculture and Rural Development.

Researchers are assessing smallholder opportunities in aquaculture and agroforestry to supply products to new and emerging markets. Aquaculture enterprises of smallholders, **targeting freshwater species found in the Mekong**, are currently inhibited by poor feed quality. Prospective feed ingredients (rice bran, plant meals and locally available resources) are being assessed to develop improved diets.

Reservoir aquaculture in highland areas can help to reduce poverty. Two related projects are examining how to optimise this industry. The first is testing management practices to identify improvements in yields and sustainability by collecting information on **fisheries and reservoir dynamics** to predict yield sizes—vital information for decision-makers at national and provincial levels. Stocking density and species combinations are also being trialled for smallholder-managed reservoirs. The second project is assessing which species are economically viable from the perspectives of both farmers and marketers. This will dovetail into recommendations for policy makers to provide incentives for those entering aquaculture and help to maximise sustainable returns.

Mud crab aquaculture is a growing industry but has relied on trash fish caught as by-product during other fishing activities. Research has now formulated **improved diets** that reduce the reliance on trash fish and are better suited to the nutritional needs of rearing crabs.

The use of mixed species in agroforestry plantations can overcome time delays between planting trees and harvesting. Researchers are

Brett Glenncross

Mud crab aquaculture is a growing industry

examining the role of different species in **providing food, income and environmental benefits from reforestation**. The financial profitability of a range of mixed species plantations is being assessed through economic modelling. Experimental trials of a variety of different species are under way to develop optimal mixes and management strategies.

Postharvest management aims to both add value and reduce losses to agricultural commodities. Vietnamese and Chinese researchers are collaborating in an ACIAR-supported project to improve grain storage. Several species of pests that attack stored grain are showing signs of emergent resistance to phosphine, the leading fumigant used in both countries and Australia. Resistant species have been characterised and revised recommendations on phosphine use developed. In villages where corn is stored researchers have introduced **a simple, easy-to-use, mobile stove to dry corn**, thus preventing mould infection and mycotoxin buildup. A new project is examining the impact of postharvest disease losses in the small temperate stone fruit industry.

Recognising the importance of agricultural extension, a project to institute an evaluation framework for research and extension activities is under way in the Ministry of Agriculture and Rural Development. This new project aims to adapt a framework developed in Australia to Vietnamese contexts. Another project has **examined the impact of changing policies towards rice production** with a major emphasis of activities focusing on capacity-building. The effects on income distribution, consumption patterns and employment from changes to these policies were all assessed. Researchers characterised issues relating to land fragmentation, land use, farm incomes and size, along with other issues stemming from policy changes, and disseminated through research journals and workshops.

A high-level Vietnamese delegation visited ACIAR head office; from left: Dr Pham An Tuan, Deputy Director, Research Institute for Aquaculture No 1, Dr Vu van Trieu, Director International Cooperation Department, Ms Marchien van Oostende, Project Officer and Mr Allan Barden, Manager, ACIAR International Program Support, Dr Ta Quang Ngoc, Minister of Fisheries, Mr Peter Core, ACIAR Director, and Mr Tran Van Hinh, Charge d'Affairés, Embassy of Vietnam

North Asia

Financial year	Regional expenditure	Percentage of total bilateral expenditure	Board target as percentage of expenditure
2004–05	$4,233,310	15.1	<15%
2003–04	$4,616,136	18.1	10-20%
2002–03	$4,158,518	15.7	10-20%

ACIAR's program in North Asia concentrates on China and where appropriate, a small program targeting food security in the Democratic Peoples' Republic of Korea. For the region, the Board and Minister have set an expenditure target of less than 15 per cent of our overall bilateral research expenditure.

Shan Lin

Dr Jiping Sheng, China Agricultural University discusses supply chain issues with vegetable growers at the Tianxiu morning market

Chris Brittenden ACIAR Country Manager, North Asia

China

Active projects in 2004–05	31
AOP budgeted expenditure in 2004–05	$3,910,000
Actual bilateral country expenditure in 2004–05	$3,926,454
Bilateral country expenditure in 2003–04	$4,231,678
Bilateral country expenditure in 2002–03	$3,951,287

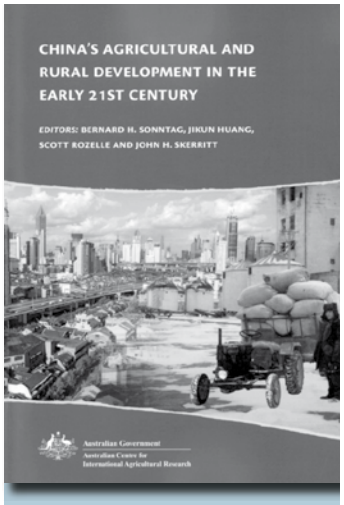
Key performance indicators	Performance 2004–05
• Increased co-investment by Chinese Government in ACIAR projects	Chinese cash co-funding in two recently negotiated projects; $1.48 million, $0.61 million. Agreement by Chinese government to co-invest in agreed priority projects.
• Five Tibetan scientists trained in new ACIAR projects	Five Tibetan scientists trained in soil management and three in animal husbandry, supporting project implementation. First Tibet AR John Allwright fellow chosen.
• Agricultural sustainability a theme of at least two-thirds of projects	Of 9 projects developed or commenced, four have a strong focus on sustainability with three addressing aspects of sustainability.
• ACIAR projects implemented to contribute to more sustainable use of grasslands in Inner Mongolia and Gansu provinces	Project to change grasslands management through livestock farming system commences, including policy analysis at local, regional and national levels.
• Evidence of more efficient use of nitrogen fertilisers in the North China Plain	Independent impact assessment demonstrated significant adoption of simple practices to reduce gaseous losses of nitrogen fertiliser from maize crops in the North China Plain and savings from reduced wastage, as worth >$200 million.
• Continued spread of conservation tillage technology to eastern parts of Loess Plateau	Independent impact assessment revealed a total of 220,000 ha of maize and wheat cropping lands placed under conservation tillage collated across 13 north-western provinces of China. The projected benefit for wheat in China is $408 million.
• Demonstration of community benefits from development of eucalypt plantations in southern China	Independent impact assessment of eucalypt tree improvement estimated total eucalypt research effort in China (by ACIAR, AusAID and Chinese partners) generated a benefit of $1.3 billion, including benefits to many households in southern China.
• Molecular marker laboratories for sugarcane breeding established	Molecular marker laboratories established for sugarcane analysis in Guangzhou and Yunnan provinces.
• Improvement of product quality attributes and resistance to stripe rust in Sichuan wheats	Improved quality and disease resistance characteristics identified in breeding lines—release of varieties several years away.
• Fumigation recommendations revised and implemented in grain storage facilities across China	Recommendations for phosphine fumigation in modern storage facilities accepted nationally with ongoing training through State Administration of Grain.

Position

ACIAR's program in China has evolved with the growing Chinese economy. Initial project activities were in eastern China, but the focus has shifted to western China and now emphasise two broad issues—raising the incomes of poor smallholder farmers and enhancing and improving the sustainable management of China's natural resource base. The sustainability of agricultural production is being addressed through

policy and technical projects relating to water, land and forest resource management in less developed regions of northwest and southwest China. The need to raise the incomes of poor farmers while addressing sustainability of increased productivity in crop, livestock and forestry systems is included in project design.

ACIAR has also initiated a small suite of projects in Tibet Autonomous Region, where activities are focusing on the need to improve crop rotations and livestock production through nutrition and animal management. Studies to improve grassland management are also in progress. Another facet of ACIAR activities is the increasing level of co-investment by Chinese Government institutions, due in part to the alignment of projects with China's highest research priority areas.



Achievements

A series of ACIAR projects is addressing sustainable **land and water resource management—a priority for Chinese agencies.** Water management in irrigation schemes, of which China has many, is vital if the country is to continue to meet food demands. Helping managers in the Zhanghe basin scheme to balance competing water demand from agricultural, urban and industrial users has been the focus of two related projects. Farmers in the scheme assess their water need and then request irrigation authorities for water release via a series of canals, in return for a fee. A water management model operating in Vietnam has been adapted to better allocate water allotments in China. This operation, in combination with a revised fee structure, has seen lowered demand for water allowing systems management to be improved. China's National Centre for Irrigation and Drainage plans to promote these findings to other irrigation scheme managers. The associated project is assessing the impact of **farmer-level water-saving initiatives** promoted by irrigation authorities. This involves surveys of farmers in the Zhanghe basin and assessment of the impacts of farm-level savings on the water system. Several farmers have also been involved in trials of water-saving approaches and technologies for three crops.

CSIRO

Improved varieties of plantation eucalypts have delivered large benefits to China

Competition for water impacts on irrigation schemes at the broader inter-system level as institutions responsible for allocating scarce water resources deal with increasing demand. A framework to assist in policy development relating to water allocation is in production for **the Yellow River Basin**. A hydrological model covering a range of interactions, such as soil-water and soil-moisture balances is to be used to develop surface-water reallocation policies. Another water sustainability project is examining options to reuse wastewater. In Shanxi Province work has begun to develop innovative uses for the CSIRO-developed 'FILTER' technology and apply this to purify waste water on a commercial scale for cropping lands.

Other project research is dedicated to utilising much of the fragile land in China's north and west—the source of much of the windblown air-pollution in Beijing and north-eastern China. Introducing land-use changes in northwest provinces that will **promote sustainable farming and reduce land degradation** has been the aim of the Government's Grain for Green Program, an initiative to convert from cropping to forestry. The success of this and associated sub-programs is being assessed by a survey of the intended target group—farmers. These interactions are revealing the strengths and weaknesses in the program and identifying policy areas in need of refinement, such as land tenure.

The **Songnen and Yinchuan Plains of northern China** face a growing salinity threat. Researchers are building hydrological and hydrogeological conceptual models of these areas before they develop new irrigation and crop production approaches. These are guiding experiments and field trials of alternative approaches and revealing potential options for their management.

Two projects are active on the Loess Plateau to improve the productivity of smallholders while reducing environmental impacts. Traditional methods had accelerated erosion but conservation tillage experiments at Dingxi and Xifeng have proven that **no-tillage systems** can produce crop yields comparable to those from conventional approaches (see box for more information). **Revegetation of the hillsides** on the Loess Plateau has been undertaken in recent times, and rates of erosion are dropping, but the impact this is having on water catchments is not clear. Models to examine broad-scale hydrology are under development to help determine future strategies for replanting activities, such as better matching locations to species selection.

Many farmers in China's west, and in Tibet Autonomous Region, rely on grasslands to support livestock farming. The **sustainable management of grasslands in western China** is both a policy priority and the subject of ACIAR research. A new project is beginning to establish the avenues for increased production efficiency to allow farmers to graze fewer animals, resulting in better quality, increased production and higher prices. Another project is examining the role of forages in crop–livestock systems as a means of growing fodder to ease pressure on overgrazed grasslands. Trials are under way to identify suitable varieties for these grasslands as well as for saline and waterlogged soils in the Yellow River Delta and acid soils in China's south. Of 200 varieties tested 53 are now being multiplied at sites in China. This work is also linking into project activities in Laos to test lucerne varieties. **Rodent control techniques** have lacked refinement and often impact on non-target species. Monitoring of rodent and other small mammal populations is under way. Field trials using the information gathered have been initiated for sustainable controls of target species. This includes work to test immuno-contraceptive vaccines that render target species infertile.

Wang Guanglin

Projects in Tibet Autonomous Region are focusing on improving crop rotations and livestock production

Conservation tillage to control soil erosion

Soils on the Loess Plateau in China are not suited to traditional agricultural systems. The deep ploughing of soils and extended fallow periods between crops have exacerbated the widespread problem of erosion.

The Plateau's soil types, slope and rainfall have combined with these tillage practices to create one of the world's worst soil erosion problems. Dust storms that regularly hit Beijing (and as far afield as Korea and Japan) often begin in the Loess region.

Conservation tillage practices, trialled at two locations on the Plateau have reduced erosion. Seed is sown into the stubble left behind after harvesting the previous crop. There is no deep ploughing. Soil is not broken up and less labour is needed in crop planting.

The traditional fallow period over summer has been replaced too. Short-season legume crops such as soybean have been planted. Perennial lucerne forages are also being planted. Productivity in following crops has increased, in part due to these short-season legumes adding nitrogen into soils, thereby boosting their fertility. The new practices worked in the project trials. But would farmers outside these trials adopt a system that contradicted their traditional ways?

Feng Jun, a farmer near one of the trials, answered the question when he approached the project team after seeing the impressive results. He and other farmers asked how they could get involved. On-farm trials of conservation tillage and crop rotations had been planned for the final stages of the project, not half-way through. But the opportunity to work with Mr Feng and others was too good to pass up, even if earlier than planned.

Some of the farmers involved in on-farm research trials are maintaining and even increasing yields under the new system. Mr Feng believes the system also offers other advantages, such as reduced labour. Watching how he and his fellow farmers are adapting to the new management approaches will help the research team to deliver its recommendations to Chinese extension agencies keen to expand the area under conservation tillage.

Deep ploughing and extended fallows have exacerbated the widespread problem of erosion

Another project aims to increase the productivity of **ruminants to meet demand for beef and milk** in Tibet Autonomous Region. Converting the benefits of pasture forages planted to stop erosion into improved beef production relies on the right choice of species. **Strategies for farmers producing livestock** in the Red Soils region, based on integrating quality forages, crop residues and by-products into feeding options, are under development. Species of forage grasses have been assessed for advantages offered in beef production—such as superior dry matter production, a greater leaf to stem ratio and ease of harvesting and transporting. Decision-support systems will help quantify these and related findings. Many of these recommendations will assist policy development regarding incentives for farmers and through extension agencies give practical support for farmers changing to the new system. **Milk is central to farming and culture in Tibet AR** and, along with other milk products, is a staple food. With demand rising by 20 per cent a year, research to increase production and tap into this market is under way. Researchers are adapting an approach similar to that used in the Red soils project above. An annual calendar of available feeds will assist smallholders.

China's recent **accession to the WTO is the subject of two projects**, designed to lessen the impacts of this transition on smallholders in the poorer western regions. The implications of national policy to support food self-sufficiency, particularly in the grains sector, are likely to create negative impacts on poorer farmers. Without some comparative production advantage based on labour and/or land these farmers will lose out as the income disparities between the wealthy east and the poorer west are heightened. Modelling of this scenario is now helping direct policy to create opportunities for poorer farmers to gain by establishing some comparative advantage. Surveys of farmers to assess current WTO accession-related impacts have also been undertaken as part of a separate project.

Assessing cabbage crop

Another area of research is delivering improvements in postharvest management of vegetable and melons. Market demand for quality produce is rising. Smallholders, both in peri-urban areas and western China, are seeking to meet this demand. Two projects aim to introduce improvements in the market chain for melons and vegetables, including more suitable packaging and greater preharvest disease and quality control. Resistance elicitors that boost a plant's natural defences have proven promising **to stop disease in melons spreading postharvest**. When combined with fungicides this approach further reduces disease outbreaks. Contamination of vegetables by disease agents is often due to poor quality inputs such as water polluted by sewage that encourage the development of pathogens. Scientists are developing tests to detect their presence on vegetables.

A suite of projects is examining how to improve existing crops by utilising improved varieties. Genotype-by-environment trials to boost **wheat yields and quality in Sichuan province** are now complete, and

analysis of data to determine yield constraints, occurrences of sterility and quality characteristics is under way. Work on **characterising the genetic makeup of Chinese sugarcane** continues. Up to 100 clones of varieties with suitable traits are being tested in China. Sugarcane seed is being exchanged between China and Australia for incorporation into breeding programs. Working with AQIS, a protocol for quarantining seed has also been developed for Australia. Two other projects are using germplasm exchange. One is determining suitable quality lines of **field peas and faba beans**, both important food legumes. Field trials and molecular studies are under way on lines exchanged between Australia and China. A similar project, involving India as well, has recently commenced for oilseed brassica improvement.

Improvement to brassica crop production is taking place through extension of past project results into a **successful Integrated Pest Management (IPM)** package, focusing on the needs of farmers in 10 locations in Zhejiang province. This will be presented in the form of a toolkit that provides farmers and extension workers with answers to questions about pests and useful information about IPM approaches.

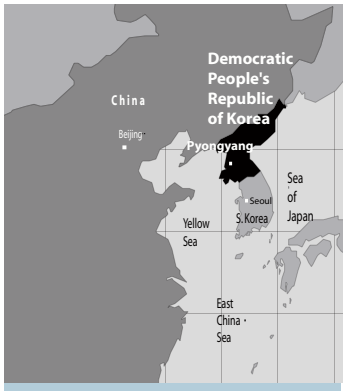
A recent, independent economic assessment into the value of joint ACIAR, AusAID, and Chinese research in the eucalypt plantation industry in China has revealed a billion dollar payoff. The research, stretching back to 1981 with the China–Australia Afforestation project, is **expected to generate a net present value of $1.3 billion** over the 30-year period from 1985 to 2015. Work on selection of cold-tolerant species for the cooler regions of China has recently concluded. The information gathered on seed management and silvicultural aspects of plantation management, such as thinning and pruning is now helping as scientists introduce the cold-tolerant species identified in the project.

Chris Brittenden

Researchers working with growers in western China are delivering improvements in postharvest management of melons.

Sally White

Vegetable farmer in China



Democratic People's Republic of Korea

Active projects in 2004–05	2
AOP budgeted expenditure in 2004–05	$340,000
Actual bilateral country expenditure in 2004–05	$306,856
Bilateral country expenditure in 2003–04	$382,458
Bilateral country expenditure in 2002–03	$207,232

Key performance indicators	Performance 2004–05
• Completion of a review of the results of research on legumes and reduced tillage and sharing of the results with other donors working in DPRK	Review demonstrated the legume hairy vetch well adapted as a winter crop before rice and maize. Fixation of nitrogen by this crop increased yields to the equivalent of 60 kg of nitrogen fertiliser. No-tillage systems with a vetch–maize rotation are feasible. Results shared with FAO, all NGOs and other donor groups working in agriculture in DPRK.
• 'Natural enemies' and potential role in controlling pests of brassica vegetables understood	Major insect pests and parasitoids of crops identified. Trials to demonstrate integrated pest management principles performed in summer white cabbage and autumn Chinese cabbage crops at two locations.

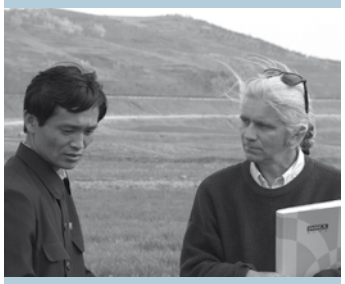
Position

ACIAR's small program in the Democratic People's Republic of Korea (DPRK) addressed issues relating to the provision of food security. Less than 20 per cent of the land in DPRK is arable and food staples are characterised by low crop productivity. ACIAR supports two collaborative projects addressing soil fertility and stabilisation of sloping lands. Wherever possible the project teams introduce improvements to crop management.

Achievements

Rice and maize are the main crops grown but yields are less than half of the expected potential. Continued experiments on rice–maize rotations in upland soils have revealed that weather conditions may be a factor in reduced yields, with rain and cloudy conditions limiting the daylight levels needed for crop development. More suitable varieties may address this issue. The use of vetch, a legume that fixes soil nitrogen, has been trialled as a fertiliser substitute. **Yields have increased** (rice by 20 per cent and maize by 11 per cent) when planted after vetch crops. Using flat crop beds with stubble retention has demonstrated that reduced levels of soil erosion are possible, with erosion falling by between 26 and 37 per cent at field sites, when compared to conventional tillage.

Introducing pest management in brassica crops is the second component of ACIAR's small program. Trials to introduce the principles of IPM have been undertaken, revealing the improvements on offer. Qualitative data collection on pest species and their distribution is under way to **gain an understanding of the natural enemies of pests** for use as possible biocontrol agents. Known pest species are also being studied in the field for their habits and life cycles.



Chris Brittenden

Dr Philip Eberbach, project scientist, Charles Sturt University, assessing reduced tillage trials with a Korean colleague

South Asia

Financial year	Regional expenditure	Percentage of total bilateral expenditure	Board target as percentage of expenditure
2004–05	$3,787,994	13.5	<15%
2003–04	$4,018,897	15.7	10-20%
2002–03	$3,953,919	13.5	10-20%

ACIAR's South Asia program operates in two groups of countries. Countries in the first group—India, Pakistan and Bangladesh—where most population is centred, are emphasised in ACIAR programs. A small number of activities are under way in the second group—comprising Nepal, Sri Lanka, Bhutan and Afghanistan. For the region, the Board and Minister have set an expenditure target of less than 15 per cent of our overall bilateral research expenditure.

Ian Willett

Rajasthan project scientists and farmers

Christian Roth

Rice fields, typical of the Punjab and Haryana regions

Dr Kuhu Chatterjee, ACIAR Regional Manager, South Asia

India

Active projects in 2004–05	22
AOP budgeted expenditure in 2004–05	$2,500,000
Actual bilateral country expenditure in 2004–05	$2,601,365
Bilateral country expenditure in 2003–04	$2,482,097
Bilateral country expenditure in 2002–03	$2,398,203

Key performance indicators	Performance 2004–05
• New arrangements for ACIAR project management and execution in India implemented, including greater involvement of NGOs and independent research institutes	Two of three bilateral projects commenced involve NGOs, while a third major project to commence early in 2005–06 is to be led by an NGO. Collaborative cost-sharing venture on wheat molecular markers with Indian government institutes under negotiation
• Half of the new projects emphasise the rain-fed tropics and sub-tropics	Two projects commenced relate to trade and technology policy. Five biophysical projects commenced or in development, address rain-fed regions: two where agriculture is fully rainfed, one in a predominantly rainfed area and two in partly rainfed areas.
• Increased emphasis on demand-led project identification in rain-fed semi-arid tropics, and all new projects have well-defined adoption pathways	Stronger emphasis on adoption pathways through involvement of local research organisations and NGOs in project design and execution, including projects in the semi-arid tropics.
• Farmers in Gujarat purchasing protected nutrient livestock feeds produced on a commercial basis	The Australian High Commissioner opened one factory in 2004 and two others will open in mid-2005.
• Improved institutional policies arising from ACIAR project research, promoting more equitable and efficient water use	Project participants still formulating policy principles.
• Novel seeding machine that handles heavy rice residues tested widely in Punjab State	Machines developed and being tested in over 10 districts.

Position

Recent changes in approach to the development of bilateral donor-funded research have revised the priority mix between India and ACIAR. It is expected that ACIAR collaboration with both the Indian Council of Agricultural Research and the Council of Scientific and Industrial Research will be jointly funded. The Indian Government is also encouraging stronger links with independent research organisations and NGOs.

ACIAR's program in India emphasises sustainable smallholder crop and livestock systems through the introduction of better varieties and improved management technologies. Broad-scale land and water resource management research emphasises policy studies on water management, and there is work in progress to analyse policy constraints relating to all the above areas. The focus of project development is on marginalised farmers in particular states within rainfed, semi-arid areas of north and central India.

Achievements

Ruminants including sheep are important providers of staple food and income for many smallholders. **Demand for milk is rising**. Smallholders have the chance to tap into new markets if they can increase animal productivity. Poor feed quality is an important limiting factor to animal productivity. Boosting milk production is the subject of related projects. The first has developed two supplements that enhance the performance of fungi living in ruminant stomaches. This increases fibre digestion, releasing nutrients that boost productivity. Increased dry matter intake has been demonstrated in trials of both treatments, lifting weight gain and milk production. An associated project recently concluded has introduced feed supplements that boost the animal's protein and fat intake. The extra fat and protein help increase milk production; cattle fed the supplements produce an extra one–two litres of milk a day, which smallholders can sell. The success of the research led to establishment of a commercial-scale factory producing feed supplements.

Sheep numbers in Maharashtra continue to increase following the introduction of a genetic trait for fecundity in sheep. Rams and ewes carrying the trait have been introduced into local flocks. The gene, originally found in Garole sheep from Bengal, **results in more multiple births**. More than half the lambs produced by mating these sheep with local animals have inherited the gene.

Cropping remains the major source of staple foods for many smallholders. Chickpea is a protein-rich crop, but yields and quality in drought-prone areas are low. Improved **varieties have been trialled for their ability to adapt to drought-prone environments**. A key component of these trials is evaluation of how well plants utilise available water. The higher the level of adjustment, the greater is the likelihood of increased adaptability to drought conditions. The role of water availability is also the subject of research into growing wheat, but in this case there is **too much water**. In some areas of India waterlogging of soils makes growing difficult. Identifying varieties that tolerate waterlogging through determining the genetic basis of their tolerance has confirmed waterlogging as a 'hidden' constraint to yield and characterised the soils where this is likely to occur. Lines tolerant to waterlogging are being incorporated into breeding programs. Scientists also uncovered the physiological mechanisms of waterlogging tolerance and they will employ this knowledge when making varietal choices in the future.

Two projects are introducing improvements to crop management for wheat systems. The first is helping farmers in Madhya Pradesh improve their management of soil nutrient inputs. Despite the availability of farmyard manure—**a potential fertiliser replacement**—it is not properly used to remediate soil nutrient deficiencies. The project team is developing recommendations for better manure use.

In north-west India rice and wheat are grown in rotation, using irrigation in the rice phase. The impacts of this practice on nitrogen in soils and

S.S. Kukal

Permanent raised bed cropping systems may provide farmers with a more sustainable approach.

water availability, together with low yields, have led to calls for a more sustainable approach to management. Permanent raised beds may offer a potential solution. Now in its fourth year of research the project has refined management strategies for raised beds, relating to the timing of irrigation and sowing. Scientists are calculating water productivity to gain an improved understanding of water balance in soils in Punjab Province. Raised beds offer a promising yield advantage when rice is replaced in the rotation by either maize or soybean. **The Happy Seeder, a tractor for direct sowing wheat into rice stubble**, developed during the project, is now being built by an Indian machinery company. Further refinement of the seeder has led to the improved 'Combo Happy Seeder'. The drill technology is now being widely tested in northwest India.

Postharvest treatment of rice and maize are largely inefficient in West Bengal, being based on old technology. These systems leave moisture in grain, a contributor to spoilage and postharvest losses. **Current storage environments are being assessed** for temperature and humidity to determine how these affect germination of seeds. A two-stage dryer to achieve reduced moisture levels is being introduced to these storage facilities, and scientists are testing and adapting it to local conditions.

Mandarin production is in decline in Sikkim Province, despite a lucrative market and rising demand. The cause of this decline was thought to be huanglongbing, or citrus greening. ACIAR-supported research has confirmed this and is examining ways to boost production both through improved management and better germplasm. The distribution of the disease has been determined through field surveys. Trees exhibiting superior health and yield in the presence of the disease have been identified and samples collected in an effort to find out why. In a separate project **to boost eucalypt plantation productivity** in Kerala state, scientists at Kerala Forest Research Institute **have received training** in improved silvicultural practices, tree establishment, water–tree interactions and growth potential modelling.

Water resource management has improved after introducing an assessment framework to analyse water institutions. Water managers now have **more accurate information**. A key focus has been identifying and developing methods to improve links between formal water resource management institutions and informal groups involved in irrigation and water allocation. A similar framework will assist the development of water allocation strategies in the Krishna Basin, to support the recently convened Krishna Basin Tribunal.

In places where water has been contaminated by salt few viable options for income generation exist. One possibility is **the use of saline water ponds for aquaculture**. In areas where low aquifers have become saline, water is pumped to holding ponds. Culturing of species such as giant freshwater prawn is being trialled. Problems of **salinity in and around tanneries** have a different origin but raise similar issues. Salinity arises from the disposal of water polluted with substances used in processing hides and skins. This includes high levels of salt. Changes to preservation and processing techniques, such as chilling, and different approaches to applying and removing salt are reducing the level of salinity in the effluent. These techniques are now being introduced to tanneries in two states.

As with many emerging trade nations in the region the impacts of WTO accession and regulations on agricultural sectors are not clear. A newly commissioned project is examining some of the likely impacts, and the implications for government policy. The aim is to **determine the changes needed to create improved market efficiencies**. State trading enterprises are a particular focal point.

Stewart Fielder

Aquaculture is being trialled in degraded inland saline areas

Pakistan

Active projects in 2004–05	5
AOP budgeted expenditure in 2004–05	$500,000
Actual bilateral country expenditure in 2004–05	$506,033
Bilateral country expenditure in 2003–04	$697,496
Bilateral country expenditure in 2002–03	$212,104

Key performance indicators	Performance 2004–05
• Initiation of a project to extend positive results obtained on use of permanent raised beds for irrigated maize-wheat cropping	Project commenced prior to wheat planting in November 2004. Two farmer groups involved from initiation with more than 20 on-farm whole-field bed plantings of wheat.

Position

ACIAR and Pakistan have collaborated on projects since 1984, with major research areas focusing on management of water resources and finding agricultural and forestry solutions to managing saline lands. Since late 2001 security issues have curtailed further project development and hindered progress on project development and implementation for existing projects. ACIAR's program has been small and remains so, concentrating on major natural resource problems. These include water efficiency of crops, salinity and drainage associated with irrigated and dryland cropping.

Achievements

In Pakistan ACIAR's three projects are addressing issues relating to crop management—two **introducing sustainable practices in 'at-risk' saline areas** and the third seeking solutions to Gemini virus diseases. A new project is furthering the results of a past project by introducing permanent raised cropping beds in Pakistan's irrigated cropping land near Mardan. Changes in soil–water interactions and the impacts of the system on crop yields are being assessed in field trials. Pakistani partners are benefiting from research results out of the related Indian project on raised beds.

The second project has **collected data from saline-affected lands** at two sites to develop farming systems suitable for saline lands. The project has developed systems that utilise salt-tolerant tree and crop species to limit the discharge of saline effluent into rivers and waterways. Other research is helping determine the way saline water and crystalline salt mobilise and drain into soils and rivers.

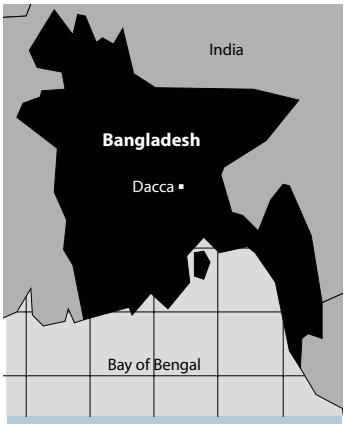
Controlling Gemini viruses, an emerging group of plant viruses that have caused severe epidemics of plant disease, is important to Pakistan's horticulture and cotton industries. Scientists have **discovered how to create genetic defences by inoculating plants** and have halted the spread of disease in controlled conditions. Initial testing reveals that these defences are most effective when virus-specific. A viral protein that helps the virus penetrate the epidermal cells of plants has also been identified.

During June 2005 the President of Pakistan, HE General Pervez Musharraf visited Australia and met with the Australian Prime Minister John Howard, with discussions including agricultural development. This led to development of a program to expand the agricultural linkages between Pakistan and Australia—the *Australia–Pakistan Agriculture Linkages Program*.

The program has three components: involving development scholarships to be managed by AusAID; facilitation of market linkages to be managed by Austrade; technical activities, to be managed by ACIAR. Each is designed to build linkages between Pakistani and Australian research scientists and organisations, academic institutions and commercial companies and markets, in order to enhance agricultural production and sustainability.

The ACIAR-managed technical activities component, funded by AusAID and costing $5 million, will involve seminars, staff exchanges, research and analytical activities. Some small projects addressing mutual priorities will begin in 2005–06.

Bangladesh



Active projects in 2004–05	3
AOP budgeted expenditure in 2004–05	$240,000
Actual bilateral country expenditure in 2004–05	$243,712
Bilateral country expenditure in 2003–04	$276,729
Bilateral country expenditure in 2002–03	$368,485

Key performance indicators	Performance 2004–05
• Outputs from arsenic project adopted by Bangladesh government and other agencies	UNICEF and national agencies currently developing communication strategies to communicate which vegetables are more likely to contain elevated levels of arsenic. No evidence of change in dietary practices or government policy.
• Training of farmers in diagnosis and management of Botrytis Grey mould and pod borer of chickpea	More than 100 on-farm, paired experiments set up during 2004–05 and training provided at each site before and during season.

Achievements

Naturally occurring **arsenic results in elevated levels in groundwater in Bangladesh. The arsenic finds its way into human diets** through several avenues. Arsenite, a type of arsenic, is the dominant form in alkaline soils in the country. Groundwater, bore water, soils and crops in three villages in Bangladesh's Munshigang, Narayanganj and Comilla districts were sampled for arsenic presence. Arsenite was found at all three locations at concentrations exceeding the current Australian drinking-water standard of 7 mg per litre. The highest concentration was 800 mg per litre with the average around 20 mg per litre. Accumulation of arsenic in crops is most likely caused by irrigation. Information is being distributed to extension agencies responsible for informing farmers in arsenic-affected areas.

A second year of field screenings of chickpea varieties for resistance to Botrytis Grey Mould (BGM) has been completed. Several hundred lines from Bangladesh, Australia and ICARDA have now been trialled, with **77 lines showing potential for effective resistance**. These will now be assessed for incorporation into breeding programs. The molecular analysis of *Botrytis cinerea*, the causal agent of BGM, has revealed Bangladesh has a relatively homogeneous *Botrytis* population. This improves the likelihood of controls working more effectively. A farmer participatory program is now beginning to test chickpea varieties for their suitability. Farmer groups testing integrated crop management packages to control BGM and pod borer are getting higher yields, thus many farmers are starting to adopt these approaches. A newly commissioned project is introducing plant health management packages for faba bean, chickpea and lentil and will also examine germplasm improvement for resistance to certain diseases and stresses.

Position

Bangladesh and ACIAR have maintained a small research program since the mid-1990s. The domination of rice farming and a multitude of agricultural problems limit Australia's capacity to deal with Bangladesh's research issues. ACIAR's strategy is to focus on constraints to production and postharvest handling of broad-acre grain crops. Projects connect with Bangladeshi programs at the International Agricultural Research Centres, to maximise impact in Bangladesh.

Other South Asian countries

Active projects in 2004–05	6
AOP budgeted expenditure in 2004–05	$270,000
Actual bilateral country expenditure in 2004–05	$436,885
Bilateral country expenditure in 2003–04	$526,575*

** The 2004–05 Annual Operational Plan grouped Afghanistan, Bhutan, Nepal and Sri Lanka together under Other South Asia, for budgeting and reporting purposes. Bilateral expenditure figures for these countries are grouped together in the table above. Similarly, key performance indicators for Other South Asia were grouped together and are reported against below.*

Key performance indicators	Performance 2003-04
• Documentation of a significant increase in aquaculture production from seasonal tanks in five districts (Sri Lanka)	Farmer-based trials successfully completed, best practice guidelines developed, and the legal and institutional enabling environment improved. All 34 farmer groups involved in the study have continued with fish culture using their own resources, with results being extended more broadly by the National Aquaculture Development Agency and through an ADB-funded project.
• Provision of new lentil cultivars to farmers (Nepal)	One lentil cultivar (Shital) released to farmers and two other cultivars nearing release.

Active projects in 2004–05	1
Wheat and maize productivity improvement in Afghanistan	

Afghanistan

Position

ACIAR's work in Afghanistan is cofunded by AusAID and implemented as multilateral projects led by CIMMYT. The short- to medium-term focus is on supporting wheat and maize production, principally by providing seed of improved cultivars and strengthening capacity in this field. Yellow rust in wheat and improved crop management techniques are also priorities.

Achievements

A follow-on project to the successful introduction of improved wheat and maize has begun. The 'Seeds of Strength' project identified wheat and maize varieties suitable for growing in local conditions. Three hundred tonnes of wheat seed and two and half tonnes of maize seed were delivered. A key outcome was **restoring farmer confidence through improved crop yields**. This helped encourage farmer participation in varietal trials. A number of scientists received training in crop breeding techniques and evaluation varieties. Training programs have enhanced skills in surveying trial plots and taught farmers to diagnose yield-limiting factors. Wheat germplasm trials and nurseries have been established, including at the Darul Aman Research Station near Kabul. The new project will continue this work, multiplying quality seed to ensure future supply. Crop management techniques tailored to the new varieties and conditions will also be included in the research. Specific subjects include introducing weed controls, improvements to plant establishment, soil fertility management and conservation tillage.

Bhutan

Active projects in 2004–05	1
A survey of fruit flies in Bhutan and a field control program for the Chinese citrus fly	

Position

Bhutan is a country where Australia has a relatively low comparative advantage. Past projects have concentrated on managing livestock diseases and current project work aims to address the issue of pest management in horticulture.

Achievements

Fruit flies are a major pest of citrus crops in Bhutan, with almost all trees suffering some degree of fruit loss. In an effort to introduce field controls researchers have surveyed the distribution of pest species and are now conducting experiments to learn more about the life cycle of target species. These include bagging of branches and selectively revealing fruit for a two-week period to determine when flies lay eggs and how these develop. This has **provided a reliable data set** on when target species deposit eggs. A second phase of the life cycle, when pupae emerge from soils in infested areas, is also being defined. This is done through capturing the emergent pupae in traps. Both experiments are providing valuable insights into the life cycle of flies to inform researchers on the best field control options.

Nepal

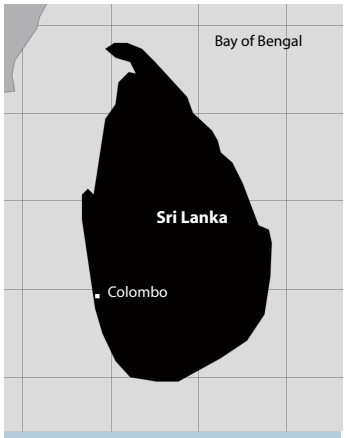
Active projects in 2004–05	1
Lentil and Lathyrus in the cropping systems of Nepal	

Position

Nepal's mainly rural population is engaged in cropping and livestock, with ACIAR's program reflecting these disciplines. Crop production and management is the main research focus, targeting the lowland Terai region, the area with the most commonality to Australian agricultural production environments.

Achievements

Genotype-by-environment trials to determine improved lentil varieties for introduction to a range of growing conditions have been completed. Two varieties that have consistently performed well in the Terai, demonstrating increased yields, are now **being scaled up for large-scale planting**. The best of these, variety ILL7723 should soon be available for widespread release, with more than 16 tonnes of seed now available through farmer participatory schemes. This variety has reasonable resistance to wilt and *Stemphyllium* blight. Lentil varieties resistant to vascular wilt (a disease caused in part by frequent planting to meet market demand) have also been identified, with two varieties highly resistant and 38 resistant. The new ILL7723 line is one of the resistant varieties. Several other resistant varieties are suitable for growing in hill and mid-hill conditions. Improved *Lathyrus* (grass pea) lines that can tolerate being sown in the waterlogged conditions of standing rice have also been identified. During the project 15 scientists received training in experimental design, data handling and statistical analysis methods relating to crop varietal trials during the project.



Sri Lanka

Position

ACIAR maintains a small program with Sri Lanka, which was an original partner country. Many agricultural scientists have a high level of skill and this, combined with their excellent English, facilitated positive training outcomes. As a result recent collaboration has focused on targeted research projects for specific issues, particularly to benefit smallholder farmers.

Active projects in 2004–05	3
Management of postharvest diseases of sub-tropical and tropical fruit using their natural resistance mechanisms	
Management strategies for enhanced fisheries production in Sri Lankan and Australian lakes and reservoirs	
Domestication of Australian trees for reforestation and agroforestry systems in developing countries	

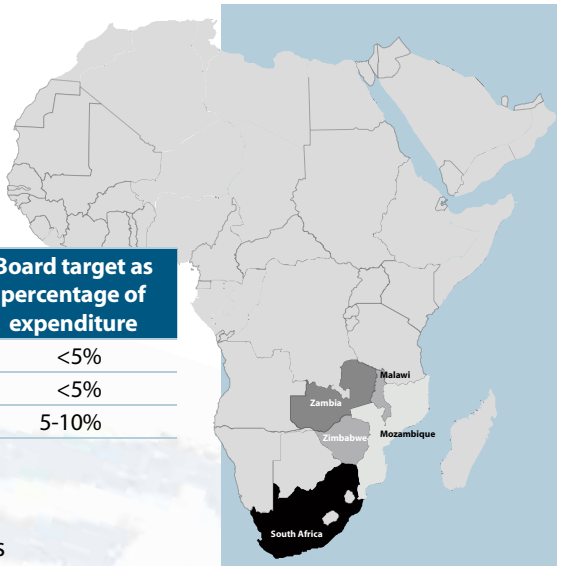
Achievements

Aquaculture practiced in perennial reservoirs has the potential to provide increased returns for smallholders in inland areas. The National Aquaculture Development Authority has **implemented a predictive yield model**, developed in earlier research, to help in stocking 44 reservoirs. Monitoring of stock densities, species combinations, growth yields and limnology (the physical, biological and geographical characteristics of water bodies) in these reservoirs has been undertaken over a two-year cycle. Data collected from 36 reservoirs have been incorporated into a best-practice model. Legislative changes to permitted activities in non-perennial reservoirs are in train to open up aquaculture opportunities in such areas. This has been achieved through cooperation between Government departments involved in the project's research and dissemination. Scientists have also developed extension materials to support the spread of aquaculture.

A forestry project, also operating in India, Indonesia, Laos, Pakistan, Philippines, Thailand and Vietnam concluded during the year. The project helped these countries better **utilise germplasm of Australian tree species**. Approaches to meet the needs of individual partner countries were implemented. A key outcome has been raising awareness of the need to use genetically improved seed. The results of this project have been published as ACIAR Proceedings 111, *Eucalypts in Asia*, available in hard copy and through the ACIAR website.

Best practice guidelines are being developed for aquaculture carried out in perennial reservoirs

Southern Africa



Financial year	Regional expenditure	Percentage of total bilateral expenditure	Board target as percentage of expenditure
2004–05	$735,199	2.6	<5%
2003–04	$745,392	2.9	<5%
2002–03	$1,219,403	4.6	5-10%

ACIAR's program operating in southern Africa concentrates on the Republic of South Africa. Some projects led by International Agricultural Research Centres in other countries are concluding. For the region, the Board and Minister have set an expenditure target of less than five per cent of our overall bilateral research expenditure.

Southern Africa

Active projects in 2004–05	8
AOP budgeted expenditure in 2004–05	$780,000
Actual bilateral country expenditure in 2004–05	$735,199
Bilateral country expenditure in 2003–04	$611,352
Bilateral country expenditure in 2002–03	$1,219,403

Key performance indicators	Performance 2004–05
• Analysis of fertiliser experiments and predictive modelling for smallholder maize production completed and results disseminated	Ten farmers hosted trials at three sites selected for testing low doses of fertiliser, however erratic rainfall saw only four trials planted at Zebediela, five at GaRampuru and one at Giyani in RSA. Rates of financial return on fertiliser investment at low rates were much more favourable than that at recommended rates.
• Four farmer groups performing 'mother-baby' trials on crop yield under different soil fertility management approaches established	Development of strong capacity for modelling smallholder maize production. Recommendation for smallholders to use low inputs. Commercial partners now packaging fertiliser in small lots to accommodate new recommendations.
• Initial identification of hybrid eucalypts suitable for dry, degraded sites in southern Africa	Analysis of eucalypt hybrids and lesser-known species for marginal lands completed. Cross-breeding to produce these hybrids conducted, and field trials to evaluate potential will be established in coming year.

Position

The Republic of South Africa is the primary focus of ACIAR's southern Africa program. Bilateral projects focus on emerging farmers, matching areas of complementarity to Australia's research capacity in temperate, subtropical and tropical agricultural environments. ACIAR has been involved in southern Africa since 1983, with many projects led by IARCs. The last of these projects are now concluding in other countries in the region, with new bilateral and IARC-led projects now targeting South Africa.

ACIAR's program emphasises income generation in crop–livestock farming systems and also forestry, to benefit smallholder farmers. The program aims to deliver these benefits to emerging smallholder farmers best able to capture improved technology and positioned to lead in the dissemination of these approaches to previously disadvantaged farmer groups.

Achievements

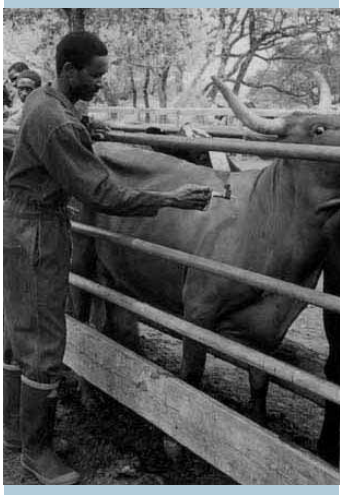
Improving the use of fertilisers in the dryer areas of South Africa and beyond is the subject of two related projects. Low soil fertility is common in southern Africa, but fertiliser use is very limited. Improved recommendations for fertiliser application, recognising the ability of farmers to purchase only small amounts and matching dose levels accordingly, have been developed for Malawi and Zimbabwe. Two pilot

sites at Chisepo district in Malawi were used to introduce and test farmer participatory approaches. These include low applications of nitrogen and phosphorus fertiliser and integrated maize–legume species crop rotations. Improved yields have resulted and farmers surrounding the trial sites are seeking legumes to plant. NGOs in Malawi and Zimbabwe have organised study visits to trial sites to allow farmer groups to see the benefits first hand. Groups that decided to participate received follow-up visits from project scientists. More than **3000 farmers in northern Malawi's Ekwendeni region are now planting legumes** and applying fertiliser. In South Africa's Limpopo province the associated project is building a similar network of farmer groups and has completed its first year of trials. Manuals on fertiliser and legume use have been distributed. Maize yields in trial sites using very small amounts of fertiliser have reached 920 kg/ha compared to 650kg/ha in control trials. The project is now scaling-up these recommendations. A secondary focus is on **the use of crop simulation modelling of fertiliser inputs** to gauge the suitability of loans to smallholders from the Landbank, a founding member of the Progress Community Development Program. A newly commenced project is addressing the relationship between legumes for cropping systems and their use as forages for livestock. This aims to help severely disadvantaged farmer groups in lands where continued pressures of cropping and grazing are exhausting the soil.

A comparison of indigenous and commercial breeds revealed that no barriers of quality prevent smallholder farmers from selling beef to commercial markets. With project assistance the **profitability in the smallholder cattle sector is continuing to rise** (see box on next page).

An improved **vaccine against the tick-borne disease anaplasmosis in cattle** is a step closer to widespread implementation. Field trials in Zimbabwe have proven to be successful in reducing disease incidence. These trials have also proven that vaccinating against anaplasmosis can be undertaken in conjunction with other tick-borne disease vaccination programs. This should allow development of a more user-friendly approach to vaccination for both cattle owners and field officers. Cryo-preservation methods for freezing vaccines prior to transport have been developed. These maintain the viability of vaccines for up to nine months. Vaccines are now in widespread use in Zimbabwe with no negative reactions reported. In many provinces a significant reduction in the number of clinical cases has been observed.

Eucalypt and acacia species have valuable uses in establishing agroforestry systems in marginalised, degraded land. A **review of eucalypt hybrids and species suitable for such conditions has been finalised for Australia and South Africa**. Clone banks of some of these have been developed and expanded in both countries. Genetic analysis techniques for field and data contexts have been adapted to local conditions and ground-truthing of suitable varieties undertaken. A significant rise in capacity for South African forestry scientists has also resulted from this



An improved vaccine against the tick-borne disease anaplasmosis in cattle is a step closer to widespread implementation. Field trials in Zimbabwe have proven to be successful in reducing disease incidence.

project. A similar project approach has recently commenced to examine Australian acacia species for agroforestry and plantation suitability in degraded lands.

New markets begin to benefit smallholders

For the Magatle, Maboi and Khomele farmer teams the Beef Profits Partnership project has opened doors that were previously closed. Those doors have opened to new beef markets and the key has come through ACIAR-supported research led by the Cooperative Research Centre for the Cattle and Beef Industry.

Prior to the project, beef markets in South Africa were closed to smallholders based on the incorrect assumption that their cattle did not produce meat of appropriate quality. Commercial farmers dominated the market, yet despite the large number of smallholder cattle, South Africa was a net meat importer.

Trials comparing the quality characteristics of smallholder and commercial cattle breeds were conducted. Several parameters regarding growth and quality in 250 steers from three smallholder and three commercial breeds were assessed. Growth rates, feed conversion efficiency (a measure of how well the cattle utilise feed to put on weight), disease incidence and carcass and meat quality were measured for cattle from both sectors. The result—there is no difference between smallholder and commercial cattle in meeting industry specifications.

The Beef Profits Partnership project is now applying these results more widely and teaching previously disadvantaged farmer teams management practices to improve cattle rearing for better quality meat.
Seventeen farmer teams, including those at Magatle, Maboi and Khomele, are now involved in focused action to test and develop methods to further increase profitability. This information is now available at farmer field days, which have increasingly aimed to attract resource-poor farmers and demonstrate project results.

More than 250 individual farmers are actively participating in project activities each month. This is substantially aiding in increasing the numbers of farmers being resourced and trained in marketing skills, gross margins, weighing cattle and keeping farm records.

Farmers involved in the project sold 581 cattle last year, through project-organised on-farm auction sales or sales where the farmers pre-weighed their cattle and knew in advance the market price for their sale animals. The sale price for these cattle totalled R1,028,620, an average of R2080/head.

Prices for smallholder cattle have not yet reached current market rates but are moving closer to commercial values and have improved considerably since the project began in 2002. As prices continue to rise and the message about improved profitability spreads the likelihood of South Africa being able to provide enough meat to match demand is also rising.

Multilateral program

AOP budgeted expenditure in 2004–05	$9,370,000
Actual expenditure in 2004–05	$9,984,197
Expenditure in 2003–04	$10,200,514
Expenditure in 2002–03	$9,827,219
Proportion of total ACIAR expenditure 2004–05	**19.4%**

Key performance indicators	Performance 2004–05
• IARC funding strategy reviewed (including core and project-specific funding balance) for period from 2005–06	Board of Management signed off on new funding framework for 2005–06 through 2007–08 at BOM Meeting 97. Framework outlines core funding categories and allocation of project-specific funding

Position

ACIAR is responsible for administering, on behalf of the Australian Government, Australia's contribution to the international agricultural research centres (IARCs). The IARCs are internationally funded, independent, non-profit institutions that carry out research and related activities to help achieve sustainable food security and reduce poverty in developing countries. Research-related activities cover agriculture, forestry, fisheries, policy and environmental management.

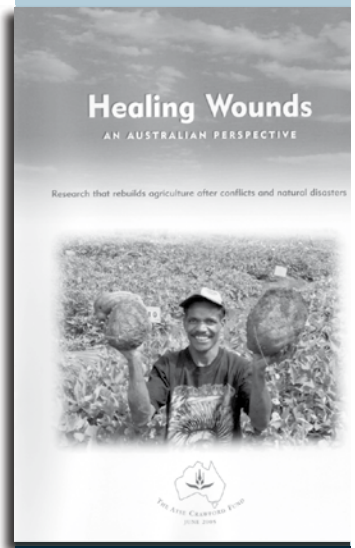
The goal of ACIAR's multilateral program is to ensure the effectiveness of, and benefits to, developing countries and Australia from agricultural research conducted by the IARCs with funds provided by Australia.

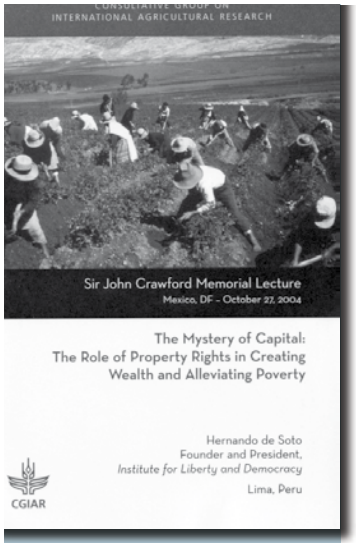
ACIAR's policy position for contributions to the IARCs involves:

- allocating around 20 per cent of ACIAR's total appropriation to the IARCs,
- allocating between one-third and half of ACIAR's annual IARC investment as project-specific funding, and
- focusing its unrestricted (non-project specific) funds on a reduced number of centres, based on comparative research advantages.

Disbursement of multilateral funds, 2004–05

In 2004–05 unrestricted contributions amounted to 55 per cent of funding allocated to IARCs. Project-specific funding accounted for 44 per cent, with the remaining one per cent of total multilateral research funding allocated to other multilateral activities. Of the 14 IARCs receiving funding, 13 received core funding (untied to specific projects). The allocations are based on the comparative advantage of individual IARCs to deliver research applicable to Australia's regional priorities. Of the 13 centres receiving core funding, five are located in the Asia-Pacific region and another six have a mandate that covers staple crops in the region. The remaining two, CAB International (CABI) and the International Food Policy





Research Institute (IFPRI), are responsible for research information systems and food policy respectively.

Thirteen funded centres received project-specific funding through ACIAR this year. Twelve of the centres are associated with the Consultative Group on International Agricultural Research (CGIAR), while one (CABI) works in an area of agricultural development of particular interest to Australia.

Project-specific research funding is designed to build tripartite research linkages, which allow scientists from IARCs, advanced research institutions in Australia and national agricultural research institutes in developing countries (particularly those that are ACIAR bilateral partners) to interact on specific issues. Projects developed under project-specific funding arrangements operate as part of ACIAR's 11 discipline-based research programs. IARC projects complement and add value to the bilateral programs run by the discipline areas. Seven new activities were initiated and four completed in 2004–05. A total of 26 projects, including these, were active in 2004–05.

ACIAR also supports relevant CGIAR system-wide initiatives. These are cross-centre programs that link research complementarities of different centres to address and resolve global and regional issues through strategic research approaches.

Other activities supported include the Asia-Pacific Association of Agricultural Research Institutions (APAARI) and the Crawford Memorial Lecture at the CGIAR Annual General Meeting.

During 2004–05 the ACIAR Board of Management endorsed new arrangements for funding IARC centres and projects, to apply from 2005–06 through to 2007–08 inclusive. Allocations of core funding to centres will continue to focus on those with a mandate relating to, or a geographic emphasis on activities in, the Asia-Pacific region.

The allocation of project-specific funding to an IARC and, where appropriate, Challenge Programs of the CGIAR will be considered annually on a competitive basis, where projects are selected on the basis of:

- relevance to ACIAR's country priorities;
- impact focus;
- networking with the National Agricultural Research Systems in ACIAR partner countries and with Australian research agencies;
- justification, scientific merit and consideration of equity amongst IARCs.

Project examples

An **International Potato Centre** project is enhancing the quality of pigs grown in sweet potato–pig livestock systems in Papua, Indonesia through the introduction of improved sweet potato varieties. Seven superior varieties have been identified. Pigs fed the improved varieties are growing faster. Trials under way at locations in eastern Indonesia

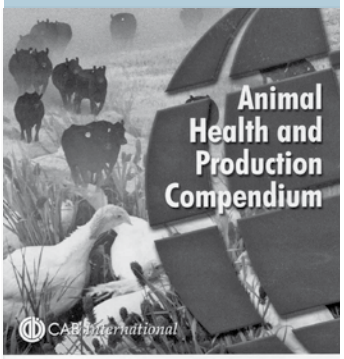
link to International Potato Center trials elsewhere in the country. The improvements to dietary composition as well as better husbandry have opened up opportunities for smallholders to fatten pigs in less time, allowing more sales throughout the year.

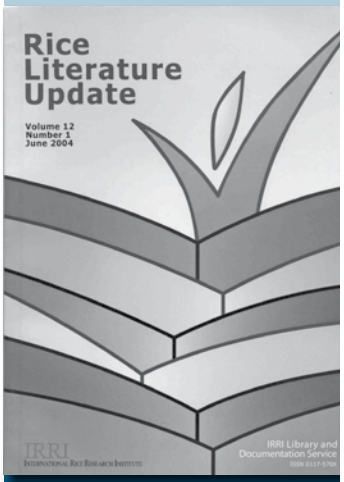
Crop–livestock systems provide ruminants with a major component of their diets. Cattle are fed crop residues, but little attention is paid to the nutritional value or quality of these residues. ACIAR is working with the **International Crops Research Institute for the Semi-Arid Tropics** (ICRISAT) to support the introduction of improved millet varieties. A newly commenced project is determining the value of the millets as cattle feed and the extent of their varietal adaptation, in order to enhance both the crop and livestock components of cattle–crop farming.

CABI is compiling an electronic, CD-ROM-based compendium detailing the results of extensive research pertaining to aquaculture industries—supported by ACIAR and other organisations. The compendium provides the aquaculture industry with text, pictures, maps, databases, diagnostic information and taxonomic keys, along with statistics, allowing easy retrieval of a range of information.

ACIAR is supporting a sustained research effort, led by the **International Rice Research Institute**, to develop apomictic hybrid rice. Apomixis is the naturally occurring ability of some plant species to reproduce asexually—plants growing from these seeds are identical to the mother plant. If new high-yielding hybrids could be reproduced asexually it would overcome the high cost and inflexibility of hybrid seed production. Molecular studies have discovered three fertilisation-independent seed (FIS) genes in *Arabidopsis thaliana*. This has led to the isolation of related genes performing the same function in different rice varieties. Transgenic lines of rice using one of the three FIS genes are now available.

The **International Food Research Policy Institute** works on projects relating to the changing global trade environment. One project is examining the implications of WTO accession for China's rural poor. While the eastern and coastal provinces of China are benefiting from global trade links, poorer farmers in the country's west may not reap the same rewards. Based on earlier studies IFPRI and ACIAR are analysing the impact of WTO accession on smallholders and offering policy options, particularly in public investment, to achieve economic growth and reduce poverty. A second project, involving IFPRI is investigating such implications on a broader-economic scale, assessing agricultural policies and levels of protection (or non-protection) for selected developing countries. Researchers now know what policies led to protection and non-protection of agriculture in India and China, and have disseminated their findings widely, including to the FAO. The impact of sanitary and phytosanitary measures on the ability of (agricultural exporting) developing countries to achieve the full benefits of trade liberalisation is also being addressed.





Power of partnerships

Helping villagers in Solomon Islands to sustainably utilise sea cucumber is the subject of a **WorldFish Center** project. Overfishing has threatened populations which, once depleted, take decades to recover. WorldFish is adopting a community-based approach to assist communities to optimise returns without depleting resources.

The *Seeds of Life* project is an excellent example of the assistance that an ACIAR-CGIAR project can provide to boost food production in a fledgling nation—in this case East Timor. ACIAR, together with five CGIAR centres (**CIAT, CIMMYT, CIP, ICRISAT and IRRI**), the Timorese Ministry of Agriculture and Catholic Relief Services established a project to assess many varieties of crops derived from their respective genebanks for suitability to local growing conditions. The project has helped improve food security through the introduction of high-performing, well adapted varieties of staple crops—maize, rice, sweet potatoes, beans, cassava and peanuts.

Location of International centres receiving core funding from ACIAR

Funding to IARCs for 2004–05

Acronym	Centre title and location	Core funding (A$)	Project-specific funding (A$)	Total (A$)
Centres associated with CGIAR				
CIAT	International Center for Tropical Agriculture, Colombia	0	150,000	150,000
CIFOR	Center for International Forestry Research, Indonesia	300,000	100,000	400,000
CIMMYT	International Maize and Wheat Improvement Center, Mexico	700,000	510,000	1,210,000
CIP	International Potato Center, Peru	330,000	200,000	530,000
ICARDA	International Center for Agricultural Research in Dry Areas, Syria	250,000	720,000	970,000
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics, India	550,000	240,000	790,000
IFPRI	International Food Policy Research Institute, United States of America	450,000	360,000	810,000
IITA	International Institute of Tropical Agriculture, Nigeria	0	0	0
ILRI	International Livestock Research Institute, Kenya	300,000	0	300,000
IPGRI	International Plant Genetic Resources Institute, Italy	300,000	390,000	690,000
IRRI	International Rice Research Institute, Philippines	850,000	450,000	1,300,00
IWMI	International Water Management Institute, Sri Lanka	500,000	400,000	900,000
World Agroforestry Center	World Agroforestry Centre, Kenya	250,000	310,000	560,000
WorldFish Center	WorldFish Center, Malaysia	450,000	330,000	780,000
Centre not associated with CGIAR				
CABI	CAB International, United Kingdom	300,000	210,000	510,000
Total funds to IARCs		**5,530,000**	**4,370,000**	**9,900,000**

Sharon Harvey, Education and Training Officer

Building research capacity

AOP budgeted expenditure in 2004–05	$2,400,000
Actual expenditure in 2004–05	$2,565,098
Expenditure in 2003–04	$2,465,634
Expenditure in 2002–03	$2,513,554
Proportion of total ACIAR expenditure 2004–05	**5.0%**

Key performance indicators	Performance 2004–05
• Training on experimental design and analysis successfully run in three countries	Courses covering experimental design and analysis, quality control and assurance run in Vietnam, Papua New Guinea and Indonesia (including courses related to tsunami rehabilitation in Indonesia)
• JAF follow-up survey identifies at least 10 former fellows whose ACIAR-sponsored studies significantly benefited their home country	11 former fellows are now working at either Director or Deputy Director level in their group/institution 78 per cent of former fellows returning to work in home country have been promoted 61 Directors of research institutions in 16 countries agreed that former fellows employed under them had passed on research skills and knowledge
• At least eight students successfully complete postgraduate studies	10 JAFs successfully completed postgraduate studies and returned to home country

Position

The training program builds the research capacity of agricultural research institutions in partner countries through the provision of discipline-specific and broader training opportunities. ACIAR conducts several specific training initiatives, the John Allwright fellowships, John Dillon fellowships and short-term cross-program courses.

Project-specific training

ACIAR only supports training that relates directly to its projects. Program activities focus on formal training provided through fellowships and courses targeting specific issues. The majority of training provided by ACIAR takes place within individual research projects; these opportunities are not included in the budget figures shown above. Training managed and funded by the ACIAR training program falls into four categories, the first representing the main expenditure:

- postgraduate fellowships (John Allwright Fellowship Scheme);
- research management training (John Dillon Memorial Fellowship);
- short-term cross-discipline training courses for developing-country staff involved in ACIAR projects;
- training courses provided through the Crawford Fund for International Agricultural Research for project staff on ACIAR-funded projects.

Formal courses may be built into the project—for example to provide training in a particular research methodology or use of new equipment—and often develop essential skills in computing or scientific communication. Informal training varies according to the type of project, the ability of the project team and opportunities that arise. There is a particular emphasis on providing postgraduate and short-course training for ACIAR project scientists from Papua New Guinea, the Pacific Islands, poorer regions of Indonesia, East Timor, Cambodia, Vietnam and Laos.

John Allwright Fellowships

John Allwright Fellowships are awarded to developing country project scientists who are or have worked on an active ACIAR project. The Fellowship involves support to undertake Masters or PhD training at Australian universities in a theme related to the project in which the awardee is engaged. Studies do not directly form part of the project. In 2004–05, $1.56 million was expended on the John Allwright Fellowship Scheme with 52 active fellowships, representing 14 countries. Ten fellows successfully completed their studies during the year while one student did not due to medical reasons. Eight candidates, from East Timor, Indonesia, Papua New Guinea, Philippines and Vietnam, commenced at seven universities in Australia. Each year a group of Fellows spend a week visiting ACIAR headquarters, where they receive training in science communication, writing research papers and other activities.

A publication entitled *The Impact of the John Allwright Fellowship Scheme—Survey Report* was produced in September 2004. The major findings indicated the success of John Allwright Fellows is very high—91 per cent of fellows have completed the higher degree. More than three-quarters of the fellows are working in a relevant position in their home country with 80 per cent working for the employer who released them to undertake the ACIAR fellowship. Seventy-eight per cent have been promoted within their organisations since receiving a qualification.

Returnee small project awards

ACIAR provides grants of up to $10,000 for John Allwright Fellows who, after completion of their postgraduate studies, have returned to relevant employment in their home country. The grant is aimed at developing small-scale research projects in the returnee's institution that are related to the research done within an ACIAR project associated with postgraduate work. Such grants may catalyse longer-term support. In 2004–05 seven small projects totalling $65,640 were awarded.

John Dillon Memorial Fellowship

The John Dillon Memorial Fellowship provides a career-development activity for a small number of outstanding partner-country agricultural scientists or agricultural economists actively involved with ACIAR projects. Leadership skills in agricultural research management, agricultural policy and/or extension technologies are developed through exposure to Australian best-practice organisations involved in these areas. Programs are tailored to meet the needs of individual Fellows.

Six John Dillon Fellows (from China, India, Indonesia, Papua New Guinea, and Philippines) visited in February–March 2005, each for approximately five weeks. This was the third group to be awarded Fellowships. Minister Downer again met with the Fellows at Parliament House for a discussion about their training and presented them with individual plaques. Expenditure for the year was $101,034.

Australian Youth Ambassadors for Development

ACIAR provides assignments for Australian Youth Ambassadors for Development (AYADs), an AusAID-funded scheme involving young Australians in a development activity in a partner country for between three and 12 months. Twelve Youth Ambassadors were assigned to ACIAR projects in developing countries during 2004–05, and seven of these have completed their assignments. Three AYADs worked in the Philippines, one was based in China, two were involved in projects in Vietnam and another worked in Cambodia.

At the end of June 2005 there were five active Youth Ambassadors. Two are based in western China on a project to improve the productivity and sustainability of farming systems in Gansu Province. In Vietnam two are assigned to a project on the use of high-value trees for timber production and enhanced community services. One is based in Cambodia at the Cambodian Agricultural Research and Development Institute, assisting with communication and publicity activities.

ACIAR John Dillon Fellow, Dr Harminder Singh Sidhu receives a commemorative award from Minister for Foreign Affairs, Alexander Downer

ATSE Crawford Fund fellowships, courses and master classes

ACIAR administers an Australian Government allocation of $650 000 to the ATSE Crawford Fund. In 2004–05, total funding through ACIAR was $766,321, with $116,321 funding for joint training activities provided as well as the Australian Government allocation. The Fund also attracted contributions from State Governments and the private sector. In 2004–05 the Fund conducted short-term training activities associated with ACIAR projects, including:

- a Master Class on Soilborne Pathogens of Wheat with 21 participants from grain-growing areas throughout China (Henan Agricultural University, China);
- Developing expertise in the management of cocoa diseases in Vietnam—2nd workshop July 2004 and 3rd workshop June 2005 (both at University of Sydney);
- Construction and training for use of reduced tillage equipment in Cambodia (NSW Department of Primary Industries);
- Biological control of tropical weeds for participants from Fiji, Thailand, Papua New Guinea and Kenya (CSIRO Entomology, Indooroopilly, Queensland); and
- Assessing forest and savannah resources in eastern Indonesia (Charles Darwin University).

These classes and workshops allow ACIAR research results to be more widely applied in developing countries, by including scientists from countries other than those where their projects are situated. The Fund also sponsors short-term training fellowships, and in 2004–05 sponsored six fellowships for members of ACIAR project teams, enabling them to undertake training in Australia for up to three months.

Cross-program training

ACIAR conducts cross-program training courses on the priority topics of:

- research management and scientific priority-setting;
- intellectual property management in agriculture;
- research methodology, including experimental design and data analysis;
- research proposal writing, and scientific report and paper writing in English;
- economics for biophysical agricultural scientists;
- agricultural extension principles;
- research monitoring and evaluation.

The following cross-program training courses were undertaken:

- *Quality Assurance and Quality Control in an analytical laboratory* (Ho Chi Minh City, Vietnam, November 2004)
  A five-day workshop on quality assurance and quality control in an analytical laboratory, facilitated by Queensland Department of Natural Resources and Mines and involving senior laboratory technicians from Vietnam, Laos and Cambodia.

- *Research management and priority-setting* (Lae, PNG, April 2005)
  The fourth in a series of six-day training workshops on research management in agriculture presented by the University of New England was held for 24 senior PNG scientists.

- *Research management and priority-setting* (Los Baños, Philippines)
  This course was the fifth in the series of six-day training workshops on research management in agriculture.

- *Post-tsunami rehabilitation training workshops* (Medan and Batam, Sumatra, Indonesia, April and May 2005)
  Three courses (one in soil analysis for soil laboratory technicians, a second on crop and soil management for extension and research staff, and a third for field staff in aquaculture) were held as part of ACIAR's response to the tsunami crisis in Aceh. Attendees at the courses included staff from research organisations and universities in affected areas.

- *Research methodology, including experimental design and data analysis* (Lae, PNG, June 2005)
  A nine-day course in experimental design and sampling for PNG project scientists (building on an earlier course provided by the University of Canberra to ACIAR project staff in Bali, Indonesia in June 2004).

- *Scientific writing and journal editing* (Cambodia, May 2005)
  The training aims to assist in re-establishing the *Cambodian Journal of Agriculture*, an important vehicle for publication of research and extension information in Khmer and English, but which had lapsed at the completion of the Cambodia-IRRI Assistance Program in 2001–02.

- *Writing scientific papers in English* (Vietnam, June 2005)
  The first of two 12-day short courses for scientists involved in ACIAR projects in Vietnam, designed to assist in publishing results in international journals. Designed and delivered by the University of Western Sydney.

John Allwright Fellows visit ACIAR for training, October 2004

Lisa Wright, Manager Communications and Secretariat Unit

Communicating Research Outcomes

AOP Budgeted expenditure in 2004–05	$700,000
Actual expenditure in 2004–05	$776,556
Expenditure in 2003–04	$742,721
Expenditure in 2002–03	$702,225
Proportion of total ACIAR expenditure 2004–05	**1.5%**

Key performance indicators	Performance 2004–05
• Evidence of continuing demand for and appreciation of ACIAR publications	6219 hard copies of publications disseminated in response to 2120 individual requests. 95 of these were sales requests that led to sale of 466 copies. 171,446 copies of ACIAR scientific publications were downloaded from the website by 19,858 separate visitors. 60,997 downloaded were ACIAR scientific publications released in 2004-05, downloaded by 5655 separate visitors.
• Targeted stakeholder groups are satisfied that their information needs are being met	Country profiles distributed to government, research and NGO sector stakeholders in Australia and partner countries. Information and displays provided at two international and two Australian conferences.
• ACIAR's use of ICTs in disseminating agricultural research information for development is consistent with current best practice	>430,000 visits to the ACIAR website over the year, by >300,000 separate visitors The number of daily visits increased by 47per cent over the year (from 960/day in July 2004 to 1400/day in June 2005) All new publications in soft and hard copy CD-ROMs supplied with two new titles Links to ACIAR resources on the Agriculture pages of the Australian Development Gateway

Position

ACIAR communicates the results of the research it funds to a wide range of stakeholders, mainly through its website and its hard and soft copy publications. It also undertakes a program of targeted awareness to make known the outcomes and impacts of research. The scientific publishing program links research and adoption through the provision of low-cost access to syntheses of information from ACIAR-funded projects or activities. Customised information resources and briefing materials support communication activities of our staff and portfolio partners. Our partnership with the Australian Development Gateway provides another avenue for linking our outputs with the broader development community.

The Communications Program assists Centre staff with developments in the use of information and communication technologies (ICTs) to transmit agricultural research information. ACIAR's website is the primary source of information as well as access to publications; materials are also supplied in traditional hard copy form and on CD-ROM. Translations into regional languages and use of multimedia technology are also supported where appropriate.

Achievements

During 2004–05 ACIAR published and distributed 15 new titles in its scientific series (eight monographs, four proceedings and three technical reports), and eight reports in its impact assessment series. These are listed in Appendix Four, together with the corporate and research awareness titles produced during the year.

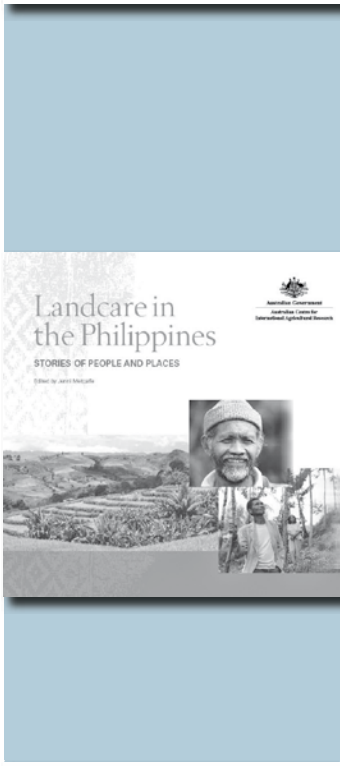
One monograph contains policy briefs on key agricultural and rural development issues facing China in the early 21st century. It addresses issues of food security, trade liberalisation and poverty, grain marketing and grain-reserve management reform, raising farm productivity, and the environmental impact of rural development.

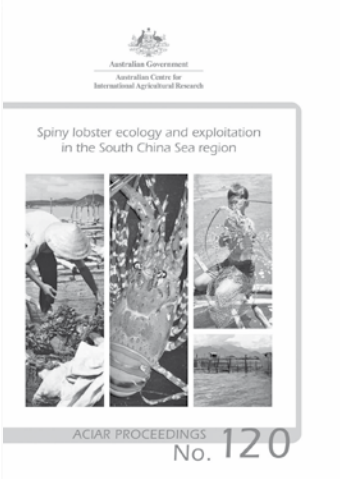
A manual on safer selection and use of pesticides includes practical guidance for risk assessment and management of pesticides, as well as a series of Vietnamese case studies on hazard identification and risk management in the field.

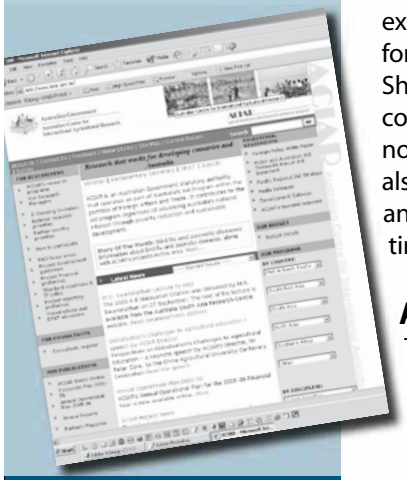
The stories of those involved in implementing conservation farming in Mindanao (farmers, community leaders, government officials, researchers and facilitators) are told in *Landcare in the Philippines* (Monograph 112). The results of 20 years of research on the versatile tropical legume *Stylosanthes*, and its use in smallholder and commercial farming systems, are summarised in another volume. *Nitrogen Fixation in Acacias* (Monograph 115) reviews current knowledge of methods to enhance and exploit the relationship between acacias and root-nodulating bacteria to increase soil nitrogen.

Another publication draws together information on control of parasitic worms in sheep and goats in the Asia-Pacific region. The book describes a range of control options practised in countries across the region, and explains how to extend knowledge of control options to smallholder communities. The accompanying CD-ROM provides additional previously unpublished text and resources.

More than 35,000 hard copies of publications were distributed, of which 466 were sold to developed world customers, earning net income of $12,621. Complimentary copies were distributed on request to 2120 people and institutions involved in agricultural research, development and extension. Records show that 19,848 individual visitors downloaded 171,446 part or full copies of publications from the ACIAR website. The most popular hard copy titles were *Diversity and Management of Phytophthora in Southeast Asia* (Monograph 114), *China's Agricultural and Rural Development in the Early 21st Century* (Monograph 116), *Control of Newcastle Disease and Duck Plague in Village Poultry* (Proceedings 117) and *Production Technologies for Low-Chill Temperate Fruits* (Technical Report 61), while the most frequently downloaded titles included *Advances in Grouper Aquaculture* (Monograph 110), *Lantana: Current Management Status and Future Prospects* (Monograph 102), *Agriproduct Supply-Chain*







Management in Developing Countries (Proceedings 119) and *Trials of Cold-tolerant Eucalypt Species in Cooler Regions of South Central China* (Technical Report 57).

The quarterly magazine *Partners in Research for Development* continued to attract favourable attention from Australian and overseas recipients. ACIAR's work in Cambodia, Laos, Papua New Guinea and China was featured during the year, in addition to programs and projects tackling animal health, sustainable fisheries, trade-related issues and capacity-building activities.

A series of Country Profiles, produced for the first time in 2004–05, was well received by stakeholders. The Profiles brought together a current overview of ACIAR's program with each country or region, together with summaries of active and recently concluded projects.

As part of Australia's commitment to increase use of ICTs to help bridge the digital divide, ACIAR has supported the transfer of technology developed at the University of Queensland's Centre for Biological Information Technology to the Philippines Rice Research Institute (PhilRice) extension services group and to IRRI's training centre. The technology consists of a tool that facilitates development of problem-based learning (PBL) resources in an interactive, online format. The outputs are five scenarios based on problems that local extension workers would encounter in their daily work with rice farmers. The resources are now being used in the pilot implementation of a Philippines Government initiative, the Open Academy for Philippine Agriculture, which uses ICTs to provide extension officers in local government units with better access to up-to-date agricultural information.

In another initiative, the use of low-cost, low-bandwidth videoconferencing technology and off-the-shelf internet conferencing tools to link project teams is being trialled in Australia, Indonesia and South Africa. The aim is to increase the level of interaction and information exchange between the partners without increasing the frequency of expensive face-to-face meetings, and eventually to use these technologies for interaction with farmers as well. An early, unexpected finding is that Short Message Service (SMS) is the preferred means of non face-to-face communication among many Indonesians. Australian team members are now using SMS as a key communication channel. Distant collaborators are also using combined phone and internet hook-ups to plan experiments and conduct simulations through a shared computer interface, in real time.

ACIAR's Website

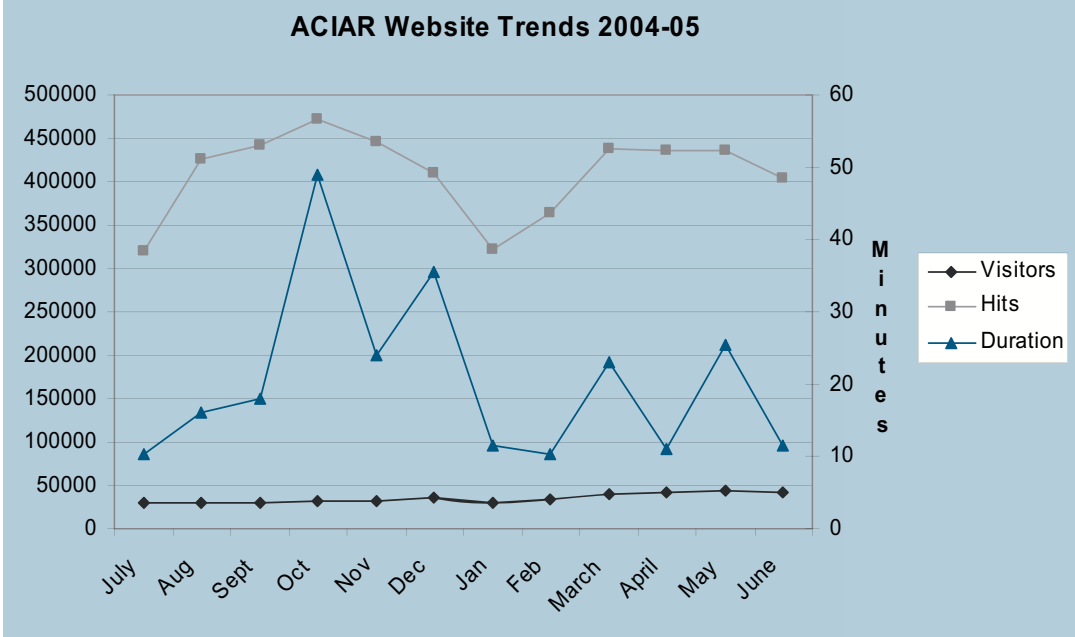
The ACIAR website (www.aciar.gov.au) is a first-stop gateway into the Centre's operations and activities. Information on current and concluded projects, ACIAR planning and reporting documents and Australian and international partners is included on the site. During

2004–05 the ACIAR Online bookshop was developed, offering researchers, end-users and interested visitors access to all available electronic scientific publications, and the facility to purchase hard copies in a secure environment.

Each publication page includes a summary of the content, pricing and author details. Electronically available publications are included as attached PDF files.

Analysis of website visitor and download statistics reveals increases in trends for visitors, downloading of publications and hits, along with the time spent visiting the site. Feedback reveals that very few visitors cannot find the material they are seeking.

The chart shows the number of visitors to the site and the number of hits, both along the left hand axis. The right hand axis relates to the time each visitor spent on the site.



Jeff Davis, Policy Linkages and Impact Assessment

Measuring Research Impacts

AOP budget expenditure 2004–05	$460,000
Actual Expenditure 2004–05	$408,624
Expenditure in 2003–04	$439,026
Expenditure in 2002–03	$228,685
Proportion of total ACIAR expenditure 2004–05	**0.8%**

Key Performance Indicators	Performance 2004–05
• Four to six assessments of completed projects will be commissioned and published in 2004–05	Seven assessments were published including three commissioned in 2003–04. An extra working paper with qualitative assessment was also published on the ACIAR website. Reports from another three commissioned studies will be published in 2005–06.
• A meta-analysis of impacts of ACIAR's investment in agricultural R&D will be undertaken	Benefit-cost meta-analysis of bilateral investments by ACIAR was completed and subjected to external peer review.
• Impacts and lessons learnt from ACIAR agricultural development policy research in three or four major countries will be evaluated to guide future investments	A generic review of ACIAR's research on agricultural policy, including a framework for assessing future projects, was published (IAS31).
• Adoption studies of projects concluded in 2000–01 will be commissioned	Ex-post adoption studies were undertaken for 11 projects completed in 2000–01.

Position

ACIAR has a significant investment in impact evaluation, managed by the Impact Assessment Unit (IAU). How to demonstrate the effectiveness of projects and the impacts arising from them remains a challenge common to aid donors. Agricultural research administrators, funders and policy decision-makers have an increasing interest in measuring the economic benefits from agricultural research and development. In addition to economic returns the questions of measuring poverty reduction, along with social and environmental benefits, are areas where refinement is needed.

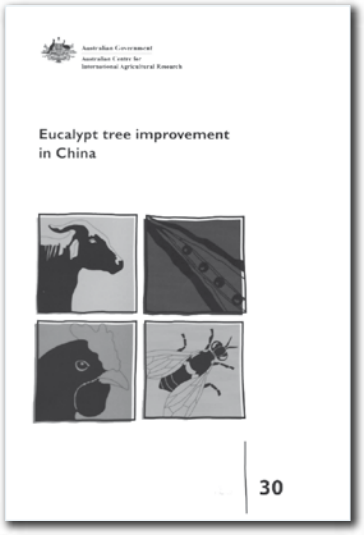
Based on this experience and through partnerships with agencies in Australia and overseas, the Centre has both refined and enhanced its methods and measures of R&D performance. This ongoing scrutiny has resulted in improved evaluation methodology to provide both quantitative and qualitative assessments of individual R&D investments and expenditure on project portfolios. In all of these evaluation exercises an increased emphasis on community impacts, poverty reduction and capacity-building, both in Australia and overseas, has been incorporated. The range of assessments utilised by ACIAR in 2004–05 has included:

- **project reviews** undertaken before the end of the project by independent experts to assess project performance against objectives,
- **adoption studies** undertaken three years after the completion of any project in which investment exceeded $400,000, and for which there were no follow-on projects. These studies are designed to highlight the level of uptake of project results;

- **economic impact assessments** undertaken once project results have been taken up by end-users. Assessments measure returns on investments;
- **thematic studies/meta-analyses** examine returns on ACIAR's investment in specific thematic research areas and the returns to the Centre's overall investment in partner countries and Australia. The information obtained assists in shaping future investment patterns.

Achievements

Eucalypt tree improvement in China



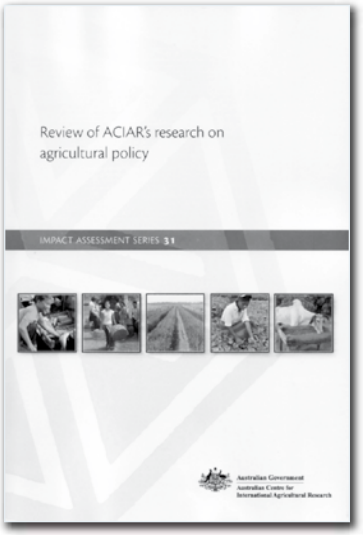
Since 1985 ACIAR has funded seven projects valued at $12 million, (equivalent to $18.2 million in today's dollars) on the development of plantations of high-yielding *Eucalyptus* trees in China. These projects have focused on three main areas: genetic improvement; silviculture (management techniques); and investigations of the sustainability of eucalypt plantations. CSIRO Forestry and Forest Projects, the Victorian Department of Sustainability and Environment and Murdoch University worked in collaboration with the Chinese Academy of Forestry. A recent impact assessment found that the ACIAR-funded projects played a central role in delivering the productivity improvements that now underpin this industry and have been partly responsible for prompting the rapid expansion in plantation area.

The total research effort in China, including China's own projects, is estimated to generate a net present value (NPV) of $1.3 billion over a 30-year period (1985 to 2015). Benefits exceed research costs by a ratio of 57 to 1. Sensitivity analysis indicates that NPV returns may range from $669 to $2148 million, reflecting the uncertainty associated with key parameters. Not all these benefits are attributable to the ACIAR-funded research. However, the investments made by ACIAR and its collaborators account for 78 per cent of total research costs, suggesting a significant proportion of benefits may be attributable to these projects. In terms of poverty reduction no hard data are available, but the research has almost certainly made a considerable contribution to improving the living standards of rural people in southern China. The assessment was published as Impact Assessment Series No. 30.

Analysis of ACIAR's investment in policy research

In 2004 ACIAR commissioned a review of the balance and directions of ACIAR's investment in policy research. While the policy projects have a narrower range of benefits, and do not seem to have some of the

very high values that are apparent in technical projects, this may be simply because there are fewer policy project estimates. The available evidence from ACIAR research suggests that policy projects are just as likely as technical projects to give very good returns. Estimates of policy project returns suggest benefit-cost ratios vary from 4.5:1 to 60:1. In contrast, benefit cost ratios from previously assessed technical projects varied from 1.7 to 180:1.



The review also found ACIAR's policy project portfolio was very successful, noting in particular:

- advantages of ACIAR's collaborative approach to research that resolve ownership issues at the outset of research;
- ACIAR's relatively low administrative overheads approach to procurement, factors that make it easier for project partners to work effectively;
- clear gains resulting from ACIAR's ability to develop long-term relationships with both Australian and partner country researchers.

The review produced eight recommendations for improvement which have been considered by the Board of Management with most accepted as a basis for future action. This thematic study/meta-analysis was published as ACIAR Impact Assessment No. 31.

Shelf-life extension of leafy vegetables

China is the world's largest producer of vegetables, and the industry is rapidly expanding. Postharvest losses of leafy vegetables in China, however, have been between 10 and as high as 25 per cent. Conservative estimates place these annual economic losses at A$1 billion. From July 1998 to December 2002 ACIAR funded a project, *Shelf-life extension of leafy vegetables*, to reduce postharvest losses. In addition to identifying postharvest problems in China and making a series of breakthrough findings on the factors affecting vegetable shelf life, some practical techniques, such as forced-air pre-cooling, improved postharvest handling systems, controlled water loss and rehydration, and modified atmosphere packaging, were developed and have been widely applied in China and Australia.

The evaluation of Chinese benefits focuses on Beijing and Zhejiang, the two regions that have adopted the new techniques, while in Australia the evaluation focuses on the adoption of modified atmosphere packaging of leafy Asian vegetables in the fresh-cut industry. The evaluation reveals large benefits to Chinese vegetable growers and distributors—a significant achievement given the fact that the project was completed only 2 years ago. Over a period of 30 years from 1998, the net present value (at a 5 per cent discount rate) of the project to China is A$149.8 million, or RMB 912.5 million. Australian vegetable growers and distributors also benefit from the project, receiving a net present value of A$1.6 million. The benefit-cost ratio is 40:1 when combined benefits and costs are measured in Australian dollars. This was published as ACIAR Impact Assessment No. 32.

Research into conservation tillage for dryland cropping in Australia and China

This report contains an economic impact assessment of two ACIAR-funded projects; *Conservation/zone tillage research for dryland farming*, and *Sustainable mechanised dryland grain production*, covering a decade from 1993-2003. The projects focused on the development of improved technologies for controlled-traffic farming (CTF) in dryland crop production in Australia, and on reduced or conservation tillage (CT) for similar purposes in China. Using the methods of economic surplus and stochastic benefit-cost analysis for a 30-year period, the assessors estimate that the projects have the potential to deliver substantial long-term benefits. The Australian benefits are estimated as increments to the past volume of CTF research. The net present value and benefit-cost ratios estimated are deemed to be the 'most likely' (the median in the case of net present value). For wheat production, the net present value of project benefits is estimated to be $79.5 million and the benefit-cost ratio is 4.9:1.

The benefits to China are also incremental and are estimated to be much larger than those for Australia, because of the greater scale of wheat and maize produced in China. Also, the innovative nature of the CT research during the projects in China means that its benefits are more readily attributable to the ACIAR-funded projects. Considering Chinese wheat production, the net present value of project benefits is estimated to be $408.5 million and the benefit-cost ratio of 25.7:1, while the values for maize production in China are $90.6 million and 5.7:1. The estimated total economic benefits of the project are a net present value of $578.6

million and benefit-cost ratio of 36.3:1. This estimate of returns to research might seem large but, based on the price and quantity of data used in this assessment, it amounts to only about 1.3 per cent of the average annual gross value of the relevant crop production in Australia and China between 2000 and 2003. This impact assessment was published as ACIAR Impact Assessment No. 33.

Identifying the sex pheromone of the sugarcane borer moth

The cane borer *Sesamia grisescens*, the larva of a species of moth, has been a major cause of sugarcane losses in PNG. Ramu Sugar, PNG's commercial sugar producer, has developed an integrated pest management strategy (IPM) to deal with the problem. While apparently reducing the level of attack, the strategy was unable to achieve a high level of control of the borer. A major addition to the IPM strategy was the introduction of sex-pheromone-baited traps to capture moths in flight and use information on moth numbers to schedule spraying. The research that led to the identification of the pheromone for use in the traps was partially funded by ACIAR. The most reliable of these benefit-cost estimates are those for the benefits to date which (at the mean) generate a very healthy benefit-cost ratio of 20:1. For relatively low expenditure the pheromone trap method appears to have significantly reduced costs and damage.

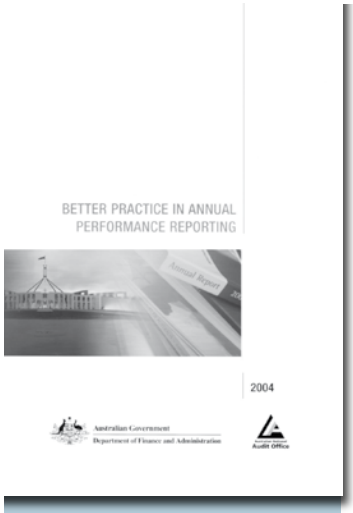
The assessment showed that the present value of cost-benefits of the research is significant, ranging between $4 million and $25 million over a 30-year time frame, with a benefit-cost ratio between 46:1 and 266:1. As the research relating to the use of the trap was funded by CSIRO and Ramu Sugar as well as ACIAR, it may not be appropriate to attribute all the benefits to ACIAR, but without ACIAR funding there is a significant chance that the project would not have taken place. This impact assessment was published in ACIAR's Impact Assessment No. 34.

Results of a social and economic impact assessment of integrated pest management strategies in Brassica vegetable crops in China

ACIAR has also funded environmental and resource-management research projects in China. Among these, the ACIAR-funded projects on *Improvement of integrated pest management (IPM) of Brassica vegetable crops in China and Australia* were implemented with significant success. In 2000, ACIAR supported the Center for Integrated Agricultural Development (CIAD), China Agricultural University, to carry out a study entitled *Household impact analysis of adoption of IPM strategies in Brassica vegetable crops in China*. The main objective was to identify the direct effects of IPM strategies on household decision-making processes and

to determine the factors that affect grower adoption of IPM. The study focused mainly at the household level and concentrated in Hangzhou, one of two pilot areas for the ACIAR projects.

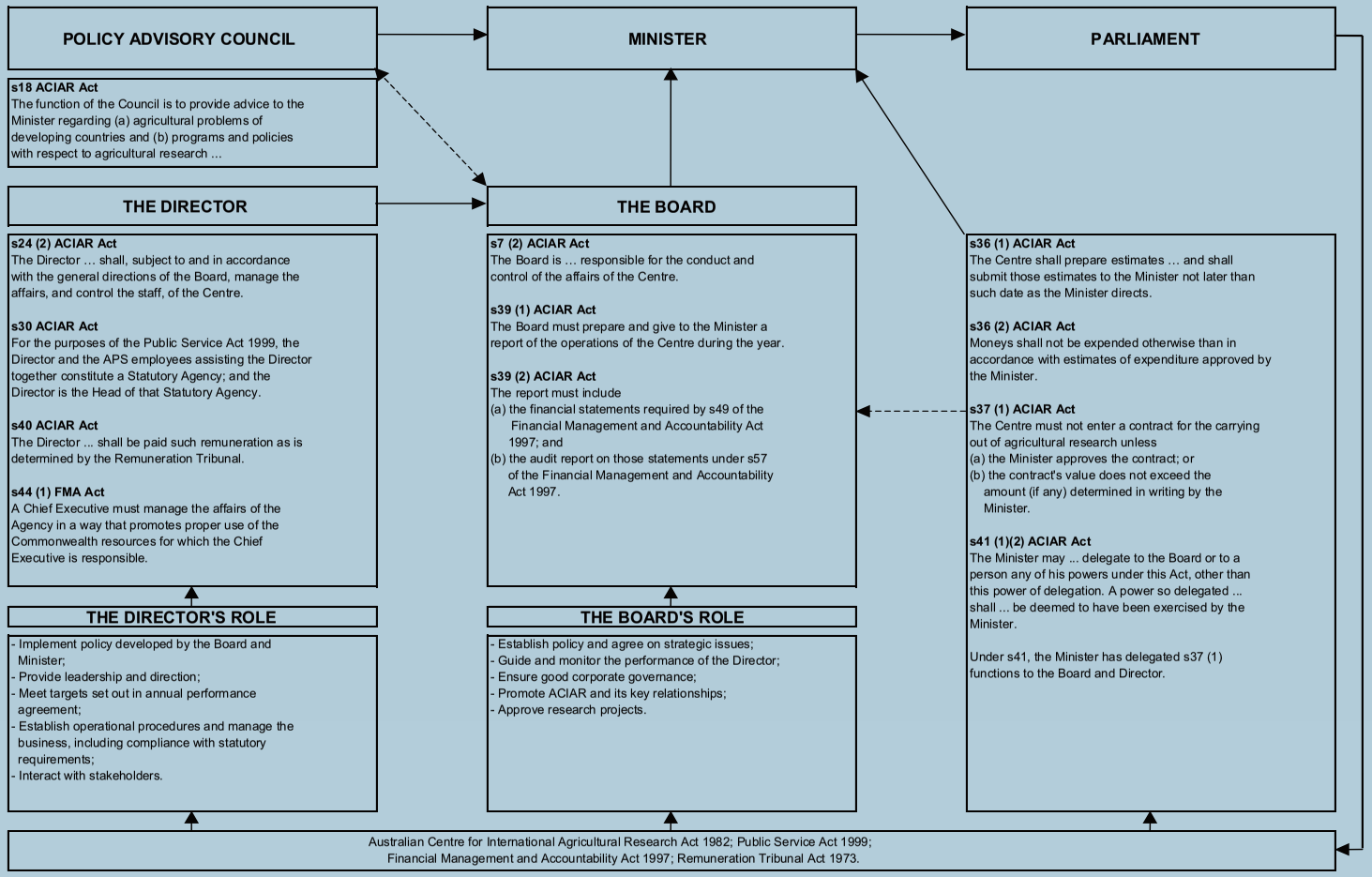
The purpose of the assessment reported here (Impact Assessment Unit Working Paper 47) was to extend the earlier analysis by investigating the longer-term impacts of the ACIAR funded projects. Local partners report adoption of 642,000 mu (42,800 ha) between 2000 and 2002. In Wenzhou, the total vegetable growing areas where IPM was adopted reached 54,300 mu (ca 3600 ha) in the period from 2000 to 2002. About 28,000 IPM-related technical brochures and leaflets were produced and distributed to vegetable growers. In addition, more than 89 technical training courses were organised, during which more than 10,000 farmers received various types of technical training. The report's authors recommended several approaches to encourage farmers to adopt IPM and other environmentally sound cultivation techniques.



Corporate governance

The Hon. Alexander Downer, MP Minister for Foreign Affairs with ACIAR Board Chair, Dr Meryl Williams, Board Member, Dr John Williams, and ACIAR Director, Mr Peter Core.

Accountability framework



Board of Management

The Board of Management and its responsibilities for the overall corporate governance of ACIAR are established under Section 7 of the ACIAR Act. Through consultation with the Minister, the Board of Management sets the strategic directions of the Centre, with the Director and senior management having responsibility for implementing and managing these directions. The Board of Management is committed to achieving the highest possible standards of corporate governance, emphasising performance-oriented management practices and accountability to Parliament and the Minister. The Board's role is to:

- establish policy and agree on high-level strategic issues,
- advise the Minister in relation to appointment of the Director, and guide and monitor the performance of the Director,
- ensure good corporate governance,
- promote ACIAR and its key relationships, and
- approve research projects.

In fulfilling these roles the Board of Management monitors corporate and program performance and provides feedback on program development. Project proposals are presented during the early stages of their development, and the Board approves research projects in the bilateral and multilateral programs (subject to subsequent endorsement by the Minister). The Board monitors and appraises the Director's performance and ensures that operational plans and control processes are in place and working.

Board composition

The Board comprises five members:

- the Chair, who is also the President of the Policy Advisory Council (see later section on the Policy Advisory Council),
- the Director (CEO) of ACIAR, and
- three part-time members of the Policy Advisory Council.

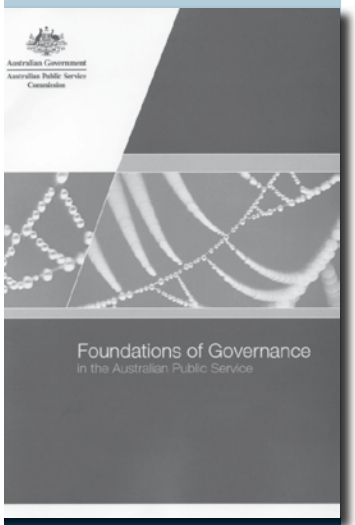
In recognition of the strong linkages between ACIAR and AusAID, the Director General of AusAID is invited to attend Board of Management meetings. Details of Board members are on page 97.

Board meetings

Meetings of the Board of Management are scheduled approximately quarterly, to enable the Board to fulfil its governance and statutory responsibilities.

The Board held five meetings in 2004–05, as follows:

96th meeting	25 August 2004	Canberra
97th meeting	15 December 2004	Melbourne
98th meeting	10 February 2005	Canberra
99th meeting	16 April 2005	Adelaide
100th meeting	26 May 2005	Canberra



The Board

Mr Peter Corish

Member

President of the National Farmers' Federation, chair of the Cairns Group Farm Leaders, and a member of the International Federation of Agricultural Producers Executive.

He has previously held the position of Chairman of Cotton Australia Limited and Chairman of the Australian Cotton Industry Council, and has served on the NFF Executive Committee since 1999.

Appointed 1 December 2003 for three years.

Meetings attended: 4

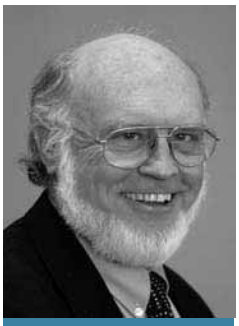
Mr Michael Taylor

Member

Secretary, Federal Department of Transport and Regional Services; former Secretary, Federal Department of Agriculture, Fisheries and Forestry; and former Secretary, Department of Natural Resources and the Environment, Victoria.

Re-appointed 1 December 2003 for two years.

Meetings attended: 4



Dr John Williams

Member

Former Chief CSIRO Land and Water, and currently Chief Scientist for NSW Department of Infrastructure Planning and Natural Resources. One of Australia's leading experts on sustainable agricultural practices and the nature of agriculture as part of natural ecosystems.

Appointed 7 July 2005 for three years.

Meetings attended: 5

Dr Meryl Williams

Chair

Executive Officer of the Future Harvest Alliance Office, Chair of the FAO Advisory Committee on Fisheries Research, Director General of WorldFish Center from 1994 to 2004, a world leader in fisheries research and research for development.

Appointed 5 August 2004 for three years.

Meetings attended: 5

Mr Peter Core

Director

Director of ACIAR since 31 July 2002. Former Managing Director of Rural Industries Research and Development Corporation and held numerous senior positions in the Australian Public Service.

Appointed 31 July 2002 for five years.
Meetings attended: 5

Board performance

During 2004–05 major milestones for the Board of Management included:

- finalisation of a performance agreement with the Director for 2004–05 and monitoring of his performance for that period,
- development of the draft Corporate Plan for 2006–2010 which provides a greater focus on the achievement of community impacts,
- development of the Annual Operational Plan for 2005–06 which seeks to codify program priorities for partner countries and provide enhanced operational transparency, and
- approval of 13 medium and 26 large projects for commencement.

Conflict of interest

Board membership represents stakeholder organisations involved in agriculture, this having the potential to give rise to a conflict of interest in some decisions. Project approval with institutions from which Board members are drawn is the most notable example. Members are required to disclose any interests that may affect their position, and where a conflict exists, the relevant Board member(s) must withdraw from a decision on that particular matter. Potential conflicts are recorded in the Board Minutes which are available for consideration by the Centre's Auditors.

Ministerial delegations, instruments and directions

Section 37 of the ACIAR Act allows the Minister to delegate authority to the Board of Management for the approval of contracts for the carrying out of agricultural research (ACIAR's research projects). The Director has delegated authority from the Minister to approve research projects and variations to projects of up to $165,000 and to enter into all contracts for projects approved by the Board of Management. The Board of Management reports to the Minister on the exercise of this delegation after every Board meeting. This mechanism enables the Minister to review proposed project-specific decisions to ensure consistency with broader portfolio considerations.

The Minister may give directions in writing to the Board of Management with respect to the exercise of its powers or the performance of its functions. This includes directions with respect to the commissioning of particular research.

In 2004–05 there were no directions given, though the Minister indicated his desire for ACIAR to:

- increase the program with Indonesia to include post-tsunami development and broader coverage into Aceh and Northern Sumatra,
- maintain a small program in Iraq, and
- limit our involvement with Democratic Peoples' Republic of Korea while progress is stalled in the context of the Six Party Talks.

Board costs

The direct cost of Board of Management operations during 2004–05 was $34,793, including fees, travel and other meeting expenses. The Director's salary and other management costs are not included. The comparative figure for 2003–04 was $44,017.

Board remuneration

The Remuneration Tribunal sets fees for Members. Daily fees for Members (other than the Director) were $448 as at 30 June 2005. The Remuneration Tribunal reviewed the annual fee for the Board of Management Chair and Policy Advisory Council President, in light of the two roles being filled by the one person. (The Chair of the Board has traditionally filled the role of the President of the Council.)

The Tribunal determined that annual remuneration for this office should be set at $30,110 per annum while the one person fills both roles. Travel is set at the Tier 2 level.

The Remuneration Tribunal reviewed the remuneration of office holders of part-time public office to take effect from 1 July 2005. Annual fees for the Board Chair and Council President increased from $30,110 per annum to $31,350 per annum. Daily fees for Members (other than the Director) increased from $448 to $467.

The remuneration of the Director is subject to the relevant determinations of the Remuneration Tribunal. These provisions enable the Board of Management to determine the total remuneration, superannuation salary and performance pay components of the remuneration package, within the parameters of Remuneration Tribunal Determination 2004/15.

The Director's remuneration package at 30 June 2005 consisted of:

- base salary of $161,082,
- PSS superannuation with an employer contribution of 12.4 per cent of base salary,
- annual performance bonus of up to a maximum of $34,268 (for 2004–05 $17,930 bonus was paid), and
- other negotiable benefits, consisting of car and spouse travel.

Lisa Wright, Policy Secretariat Manager

Stephanie Adler, Project Officer, Policy Secretariat

Post 30 June developments

ACIAR, as a statutory authority of the Department of Foreign Affairs and Trade, will be reviewed by the Department and the Portfolio Minister, following the Review of Corporate Governance of Statutory Authorities and Office Holders Report. The Report, by Mr John Uhrig AC, examined governance structures and provided two models by which statutory authorities may be governed.

The review of ACIAR will examine the Centre's governance structure in light of the two templates—executive management or board management—outlined in the Uhrig report. Responsibility for assessing statutory authorities resides with the Portfolio Minister.

ACIAR and the Department have begun to undertake the assessment of ACIAR which will be completed in time for the 31 March 2006 deadline.

Financial accountability and compliance

As a statutory authority ACIAR is subject to the policy guidelines determined by government from time to time regarding accountability, reporting, review and general operations and is accountable through the Minister to the parliament. It is also subject to government financial and accounting policies and procedures. Staff members are employed under the Public Service Act. Within these constraints, the centre has the power to do all things it considers appropriate for the performance of statutory functions.

ACIAR derives its financial authority from the ACIAR Act. Under the ACIAR Act the Centre, as a body corporate, may acquire, fold and dispose of real and personal property, and may sue and be sued in its corporate name. Financial powers and duties derive from the *Financial Management and Accountability Act 1997* (FMA Act) and subordinate regulations and Orders.

The Centre follows accounting practices in accordance with the FMA Act and other related legislation and recognised accounting standards. ACIAR's Annual Financial Statements, presented in accrual accounting format on pages 109-143 of the report, along with all financial transactions made by the Centre, are subject to examination by the Australian National Audit Office.

Insurances

Comcover as the manager of the Commonwealth's insurable risks provides corporate insurance for the Centre. Comcover's coverage includes general and products liability, professional indemnity, Director's and officer's liability, property loss and damage, personal accident and official overseas travel. The cost of insurance for 2004–05 was $119,631 (excluding GST). The premium paid in 2003–04 was $138,804.

Liability and professional indemnity insurances were not required to be invoked in 2004–05.

Risk Management

ACIAR has in place a risk management policy, including an overall risk management plan comprising a series of more specific risk assessments and risk treatment plans. Significant business risks are addressed in these risk assessments and risk treatment plans, all of which are reviewed and updated annually. They include, at the highest level, risks associated with the critical success factors of ACIAR's Corporate Plan 2001–06.

The ACIAR Audit Committee considers each annual update with a rolling three-year program of internal audits developed directly from these risk assessments. Those activities assessed as carrying the highest risk are audited during the three-year cycle wherever it is likely that an internal audit will value-add to the management and treatment of such issues. This program of internal audits is considered in outline every three years and the annual program is considered in greater detail. Internal audits include those conducted for probity reviews to ensure compliance of general probity principles of the *Commonwealth Procurement Guidelines* and *Chief Executive Instructions*.

Every second year, in accordance with the *Commonwealth Fraud Control Guidelines 2002*, a fraud-specific risk assessment is carried out and the fraud control plan is reviewed and updated. The plan was last updated in September 2003.

During 2004–05 ACIAR fulfilled its annual reporting requirements on fraud control to the Attorney-General's Department and to the ANAO.

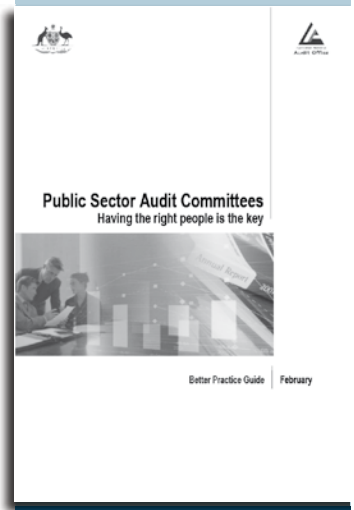
Certification is provided that ACIAR has prepared fraud risk assessments and fraud control plans, and has in place appropriate fraud prevention, detection, investigations, reporting and data collection procedures and processes that meet the specific needs of the agency and comply with the *Commonwealth Fraud Control Guidelines 2002*.

All project proposals are assessed by senior ACIAR staff and the Board of Management against various risks, such as capacity and expertise issues; duplication of effort; non-adoption of results; intellectual property concerns; and negative environmental outcomes.

Audit Committee

ACIAR's Audit Committee is established in accordance with Section 46 of the *Financial Management and Accountability Act 1997*. The Committee promotes and facilitates communication between the Centre's auditors (both internal and external) and management. The Committee has the objectives of:

- providing advice to the Director and Board of Management that ACIAR's control framework is in place and working effectively,
- ensuring the objectivity and reliability of externally published financial information, and



- ensuring the Director and Board of Management that adequate systems are in place to ensure that ACIAR complies with all legislative and other requirements.

In fulfilling its corporate governance responsibilities and overall accountability for the Centre's operations, the Board of Management provides advice on each three-year audit program, and provides general advice on arrangements for the Audit Committee and on audit matters arising from the Committee's deliberations.

Four Audit Committee meetings were held in 2004–05. Audit Committee membership and attendance during the year were as follows:

Member		Meetings attended
Mr Len Early	Chair	4
Ms L Atkinson	External Member	4
Mr Michael Brown	Centre Deputy Director (ceased 17.11.2004)	0
Dr R Trewin	Centre Program Manager	4
Dr D Templeton	Centre Unit Manager (ceased 17.11.2004)	2
Dr S Hearn	Centre Senior Advisor (appointed 18.4.2005)	2

Internal Audit

ACIAR Management provides an audit report to each Board meeting. The Audit Committee Chair attends two Board meetings to:

- present an updated annual Audit Plan for endorsement, and
- present audited financial Statements for Board sign-off.

The Chair of the Audit Committee is an external appointee and each Committee meeting is supported by advisers from our external auditors (ANAO), internal auditors (Acumen Alliance) and the Centre's Finance Unit, with the Finance Manager and Accountant both ex-officio members and responsible for Secretariat support.

Acumen Alliance is contracted to undertake various internal audit reviews to support the Committee. Internal audit reviews conducted in 2004–05 were:

- Intellectual Property #,
- Project Development and Approval Timelines #,
- Financial procedures—including credit cards and payroll,
- Review of action plans, and
- Competitive tendering and contacting *.

 # Audit fieldwork completed in 2003–04; final report received after 1 July 2004.
** Audit fieldwork completed in 2004–05; final report received after 30 June 2005.*

Audit Program 2005-2008

At the Audit Committee meeting in June 2005 the Audit Committee agreed on a more strategic focus for the development of a new three-year audit plan. This will focus on major decisions made by the Board of Management over recent years and tailor an internal audit program to assess the impact these decisions will have. Normal compliance audits will continue, but the timeframe will be extended based on satisfactory results of recent audit work.

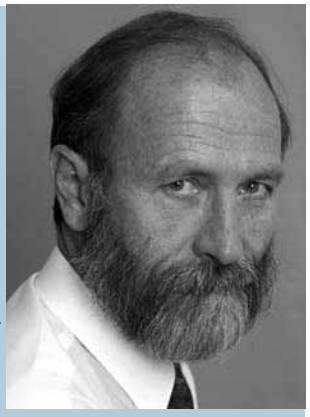
The Director

The office and role of Director as the Chief Executive Officer of the Centre is established under Section 24 of the ACIAR Act. Subject to, and in accordance with, the general directions of the Board, the Director manages the affairs, and controls the staff, of the Centre. Specifically, the Director's functions are to:

- develop strategic and operational plans for presentation to, and approval by, the Board of Management,
- ensure that these plans and their component parts are implemented,
- ensure the Board of Management is provided with relevant and timely decision support information,
- ensure the Board of Management is properly informed about evolving key issues and alternatives for dealing with them,
- manage the operational functions of the Centre consistent with its strategic and operational plan,
- provide Centre staff with strong and empowering leadership to enhance the motivation, focus and satisfaction they derive from their contribution to the Centre,
- nurture and enhance research alliances and represent and promote the Centre at forums and workshops, and
- maximise the adoption of research outputs.

The Director is appointed by the Governor-General for a term of up to seven years and is subject to the determinations of the Remuneration Tribunal. The Tribunal has determined the Director to be an officer in the Principal Executive Officer (PEO) structure, at PEO Band C. The Board of Management is the identified Employing Body for remuneration purposes.

The current Director, Mr Peter Core, began a five-year term on 31 July 2002.



Peter Core, Director

Melina Tensen, Executive Assistant to the Director

The Policy Advisory Council

The Policy Advisory Council is established under Section 17 of the ACIAR Act. The Council's function is to provide advice to the Minister regarding:
(a) agricultural problems of developing countries, and
(b) programs and policies with respect to agricultural research for either or both of the following purposes:
    (i) identifying agricultural problems of developing countries, and
    (ii) finding solutions to agricultural problems of developing countries.

The role of the Council utilises stakeholder knowledge to provide a valuable overview for advising the Minister, the Board of Management and the Centre on matters including:

- national and regional development constraints,
- opportunities for research and development collaboration,
- national and regional research priorities, particularly those of ACIAR's partner countries,
- the matching of Australian expertise (Australia's competitive advantage) with these priorities,
- modes of operation for ACIAR, and
- sources of national and international expertise.

Council meeting

Council meetings are held annually, in Australia, over several days to discuss areas related to its role and functions. During 2004–05 the Council met in Adelaide on 16 April 2005, which included discussions with the Minister, and in Brisbane from 17–19 April.

At its meeting, the Council gave priority consideration to:

- greater focus on the achievement of community impacts as set out in a draft of the Centre's 2006–2010 Corporate Plan,
- research priorities as set out in a draft of the Centre's 2005–06 Annual Operational Plan, and
- a presentation from AusAID on emerging issues and trends in Australia's aid program.

Council composition

Council Membership is limited to 14, comprising a President (the Chair of the Board of Management), ACIAR's Director, the Director General of AusAID or his nominee, and not fewer than nine, nor more than 11, other members appointed by the Minister for Foreign Affairs. Members are appointed from stakeholder organisations in Australia and partner countries to bring a range of agricultural and development experience. The Minister is required, under the Act, to ensure that a substantial number of the members of the Council are residents of countries other than Australia, and to have regard for the knowledge of appointees concerning the agricultural problems of developing countries or their experience in organising or conducting agricultural research.

ACIAR Policy Advisory Council members and observers during their annual meeting at Adelaide, Australia, April 16, 2005.

Left-Right: Dr John Skerritt, Mr Xu Hai (China), Mr Ian Kershaw, Dr John Williams, Dr Achmad Suryana (Indonesia), Mr Peter Core, Dr Meryl Williams, Mr Michael Taylor, Mr Peter Corish, Dr Jimmie Rodgers (Pacific), Dr Nguyen Van Bo (Vietnam), Dr Bill Winter, Dr Pat Faylon (Philippines).

Council costs

During 2004–05, the direct costs of the Policy Advisory Council were $18,754, compared with a figure $50,554 for 2003–04.

Membership of the Policy Advisory Council at the time of its meeting in Adelaide on 16 April 2005, and attendance, is set out in the accompanying table. The Policy Advisory Council meeting was also attended by Dr Jimmie Rodgers from Fiji, Dr Achmad Suryana from Indonesia and Mr Xu Hai of China, all as observers.

Member	Term of appointment	Meeting
Dr Meryl **Williams** Executive Officer Future Harvest Alliance Office Pulau Pinang MALAYSIA	President 5/8/2004–4/8/2007	Yes
Mr Brown **Bai** Chairman Rural Industries Council Port Moresby PAPUA NEW GUINEA	Appointed member 7/3/2005–6/3/2008	No
Mr Peter **Core** Director ACIAR Canberra ACT	Ex officio member 31/7/2002–30/7/2007	Yes
Mr Peter **Corish** President National Farmers' Federation Canberra ACT	Appointed member 1/12/2003–30/11/2006	Yes
Mr Bruce **Davis** Director General AusAID Canberra ACT	Ex officio member	Yes (nominee)
Dr Patricio **Faylon** Executive Director Philippine Council for Agriculture, Forestry and Natural Resources Research and Development Los Baños PHILIPPINES	Appointed member 10/3/2003–9/3/2005 10/3/2005–9/3/2008	Yes
Mr Jim **Hallion** Chief Executive Department of Primary Industries and Resources South Australia Adelaide SA	Appointed member 1/3/2004–28/2/2007	Yes
Mr **Jia** Jingdun Deputy Director General Ministry of Science and Technology Beijing CHINA	Appointed member 10/3/2003–9/3/2006	No
Dr **Nguyen** Van Bo Director General Department of Science and Technology, Ministry of Agriculture and Rural Development Hanoi VIETNAM	Appointed member 1/3/2004–28/2/2007	Yes
Dr Mangala **Rai** Secretary Department of Agricultural Research and Education and Director General Indian Council of Agricultural Research New Delhi INDIA	Appointed member 10/3/2003–9/3/2006	No
Mr Michael **Taylor** Secretary Department of Transport and Regional Services Canberra ACT	Appointed member 1/11/1997–31/10/2000 1/11/2000–31/10/2003 1/12/2003–30/11/2005	Yes
Dr John **Williams** Canberra ACT	Appointed member 16/7/2002–30/6/2005 7/7/2005–6/7/2008	Yes

Paul Tyrrell, Chief Finance Officer

Chief Finance Officer's Review

Funding and other revenue

ACIAR's funding is mainly provided through Commonwealth appropriation, as determined in the Federal Budget in May each year. In 2004–05 our appropriation was $47.523m.

This appropriation is supplemented through:

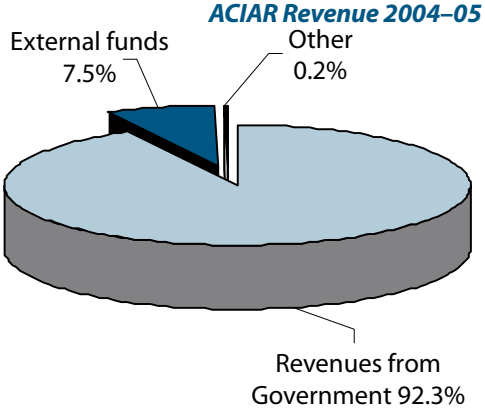
- co-funding of projects by AusAID, the Grains Research and Development Corporation and other relevant funding agencies, and
- a small revenue flow from the sale of ACIAR scientific publications.

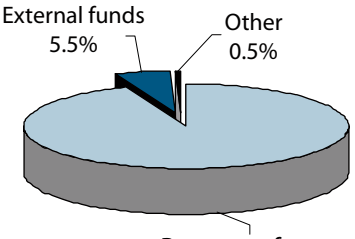
Due to the varied timeframes of ACIAR's project activities external revenue fluctuates between years depending on project start and finish dates and the Centre's involvement in particular projects.

Appropriation has remained constant in real terms during the past four financial years.

Total revenue for 2004–05 was $51.492m.

ACIAR Revenue 2004–05





ACIAR Revenue 2003–04

Program and operational costs

ACIAR's mandate directs the Centre to fund both bilateral and multilateral research and training activities (including educational fellowships), for the benefit of developing countries. In addition, the Centre disseminates publications and measures the impacts of its projects.

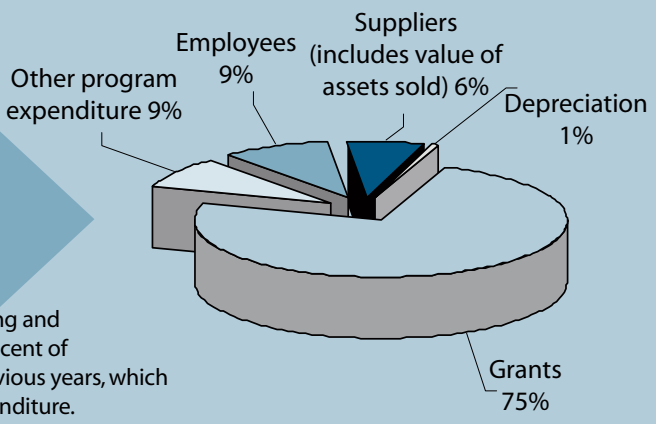
These activities account for 84 per cent of expenditure, expressed as grants and other program expenditure in the chart below.

Expenditure

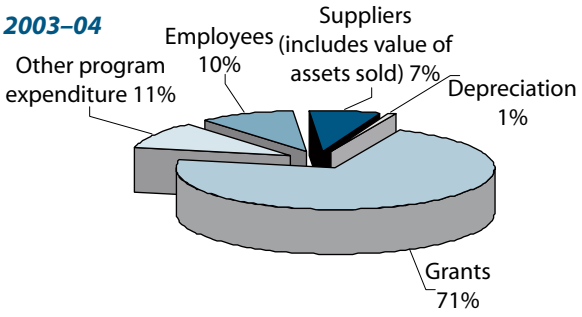
The costs of supporting these operations, in staffing and administration, accounts for the remaining 16 per cent of expenditure. This represents a reduction from previous years, which have held steady at 17 to 18 per cent of total expenditure.

Total expenditure in 2004–05 was $51.401m.

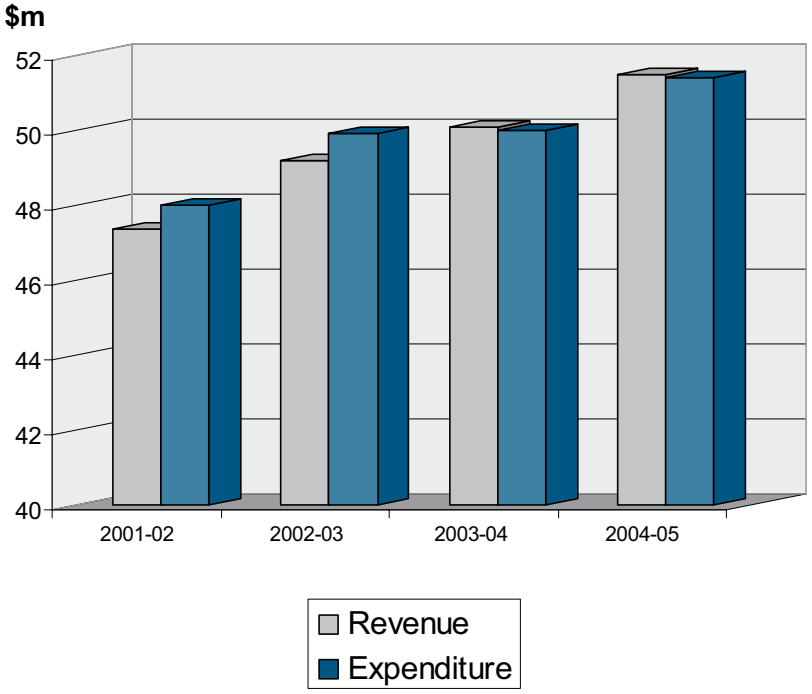
ACIAR Expenditure 2004–05



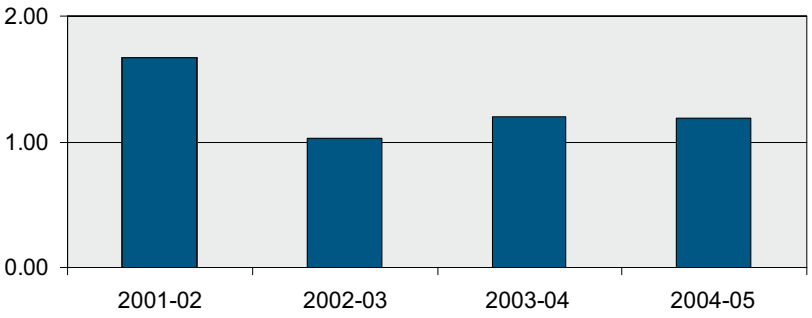
ACIAR Expenditure 2003–04



Revenue and expenditure



Current ratio (current assets/current liabilities)



Operating result and financial position

ACIAR operates a balanced budget and aims to achieve a small surplus each financial year. In 2004–05 this surplus was $90,330.

ACIAR is focusing on better balance sheet management by closely monitoring its cash requirements and movements in provisions. Our current ratio closely reflects this approach and is being maintained at an optimal level (1.00). The Centre will continue to operate a balanced budget to maintain this

Accounting policies

ACIAR complies with relevant accounting standards, relevant legislation and the Finance Minister's Orders. The Centre's Executive and Finance Section work closely to deliver a balanced budget, including responding to the emerging needs of the Australian Government in delivering effective aid.

In 2004–05 ACIAR responded to the December 2004 tsunami, increasing funding to Indonesia to deliver training and to begin implementing new projects.

Financial statements

The Board noted:

(a) the draft financial statements for 2004–05 that were considered by the ACIAR Audit Committee on 27 July 2005. ***Decision 101/21***

(b) the management representation letter to Ernst and Young.

28 July 2005

Paul Tyrrell

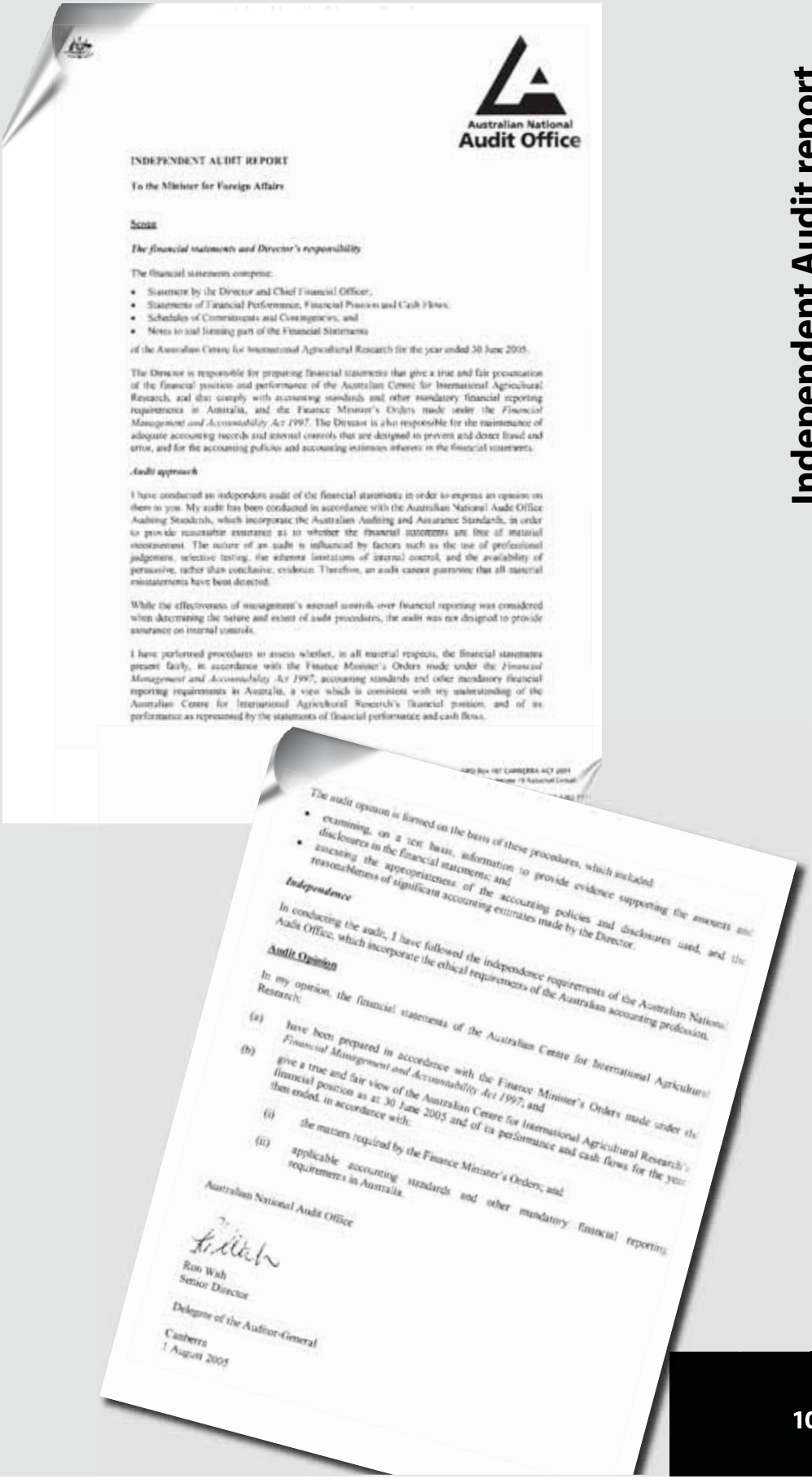
Gloria Radosavljevic

ACIAR's finance team

Henry Lee

Frances McPherson

Independent Audit report



Australian National Audit Office

INDEPENDENT AUDIT REPORT

To the Minister for Foreign Affairs

Scope

The financial statements and Director's responsibility

The financial statements comprise:

- Statement by the Director and Chief Financial Officer;
- Statements of Financial Performance, Financial Position and Cash Flows;
- Schedules of Commitments and Contingencies; and
- Notes to and forming part of the Financial Statements

of the Australian Centre for International Agricultural Research for the year ended 30 June 2005.

The Director is responsible for preparing financial statements that give a true and fair presentation of the financial position and performance of the Australian Centre for International Agricultural Research, and that comply with accounting standards and other mandatory financial reporting requirements in Australia, and the Finance Minister's Orders made under the *Financial Management and Accountability Act 1997*. The Director is also responsible for the maintenance of adequate accounting records and internal controls that are designed to prevent and detect fraud and error, and for the accounting policies and accounting estimates inherent in the financial statements.

Audit approach

I have conducted an independent audit of the financial statements in order to express an opinion on them to you. My audit has been conducted in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing and Assurance Standards, in order to provide reasonable assurance as to whether the financial statements are free of material misstatement. The nature of an audit is influenced by factors such as the use of professional judgement, selective testing, the inherent limitations of internal control, and the availability of persuasive, rather than conclusive, evidence. Therefore, an audit cannot guarantee that all material misstatements have been detected.

While the effectiveness of management's internal controls over financial reporting was considered when determining the nature and extent of audit procedures, the audit was not designed to provide assurance on internal controls.

I have performed procedures to assess whether, in all material respects, the financial statements present fairly, in accordance with the Finance Minister's Orders made under the *Financial Management and Accountability Act 1997*, accounting standards and other mandatory financial reporting requirements in Australia, a view which is consistent with my understanding of the Australian Centre for International Agricultural Research's financial position, and of its performance as represented by the statements of financial performance and cash flows.

The audit opinion is formed on the basis of these procedures, which included:

- examining, on a test basis, information to provide evidence supporting the amounts and disclosures in the financial statements; and
- assessing the appropriateness of the accounting policies and disclosures used, and the reasonableness of significant accounting estimates made by the Director.

Independence

In conducting the audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the ethical requirements of the Australian accounting profession.

Audit Opinion

In my opinion, the financial statements of the Australian Centre for International Agricultural Research:

(a) have been prepared in accordance with the Finance Minister's Orders made under the *Financial Management and Accountability Act 1997*; and

(b) give a true and fair view of the Australian Centre for International Agricultural Research's financial position as at 30 June 2005 and of its performance and cash flows for the year then ended, in accordance with:

(i) the matters required by the Finance Minister's Orders; and

(ii) applicable accounting standards and other mandatory financial reporting requirements in Australia.

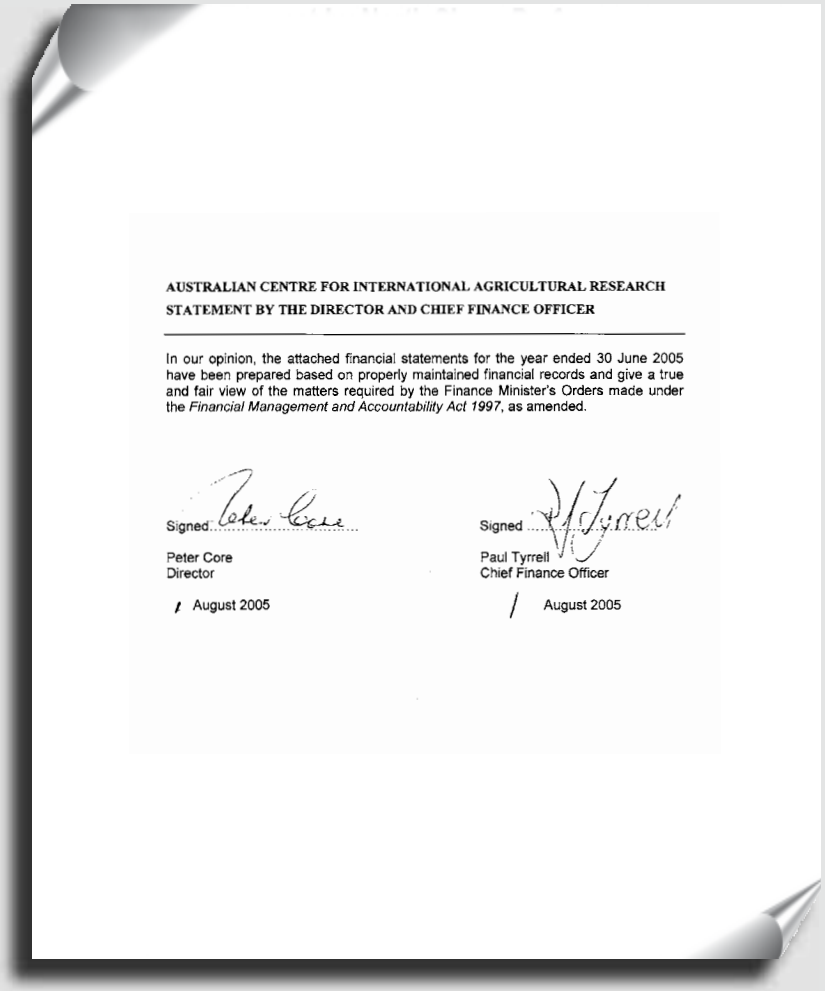
Australian National Audit Office

Ron Wah
Senior Director

Delegate of the Auditor-General

Canberra
1 August 2005

Statement by Director and Chief Finance Officer



AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURAL RESEARCH
STATEMENT BY THE DIRECTOR AND CHIEF FINANCE OFFICER

In our opinion, the attached financial statements for the year ended 30 June 2005 have been prepared based on properly maintained financial records and give a true and fair view of the matters required by the Finance Minister's Orders made under the *Financial Management and Accountability Act 1997*, as amended.

Signed

Peter Core
Director

7 August 2005

Signed

Paul Tyrrell
Chief Finance Officer

7 August 2005

AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURAL RESEARCH
STATEMENT OF FINANCIAL PERFORMANCE
for the year ended 30 June 2005

	Notes	2005 $	2004 $
Revenues from ordinary activities			
Revenues from Government	4A	**47,523,000**	46,832,000
Goods and services	4B	**16,107**	18,522
Interest	4C	**2,756**	1,248
Revenue from sale of assets	4D	**2,204**	1,890
External funds revenue	4E	**3,841,142**	3,183,556
Other revenues		**106,387**	36,528
Revenues from ordinary activities		**51,491,596**	50,073,744
Expenses from ordinary activities			
Administration			
Employees	5A	**4,878,925**	4,929,832
Suppliers	5B	**3,329,222**	3,574,385
Depreciation and amortisation	5C	**341,484**	324,230
Value of assets sold	4D	**5,815**	2,861
Program expenditure			
Grants	6A	**38,141,689**	35,696,716
Other program expenditure	6B	**4,704,131**	5,467,049
Expenses from ordinary activities		**51,401,266**	49,995,073
Net surplus / (deficit) from ordinary activities		**90,330**	78,671
Net surplus / (deficit)		**90,330**	78,671
Total revenues, expenses and valuation adjustments recognised directly in equity		**-**	-
Total changes in equity other than those resulting from transactions with the Australian Government as owner		**90,330**	78,671

The above statement should be read in conjunction with the accompanying notes.

AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURAL RESEARCH
STATEMENT OF FINANCIAL POSITION
as at 30 June 2005

	Notes	2005 $	2004 $
ASSETS			
Financial assets			
Cash	7A	**580,433**	459,370
Receivables	7B	**2,587,640**	2,316,130
Total financial assets		**3,168,073**	2,775,500
Non-financial assets			
Infrastructure, plant, equipment	8A,C	**547,094**	663,329
Intangibles	8B,C	**197,747**	117,228
Prepayments	8D	**195,742**	413,981
Total non-financial assets		**940,583**	1,194,538
TOTAL ASSETS		**4,108,656**	3,970,038
LIABILITIES			
Provisions			
Employees	9A	**1,379,223**	1,523,039
Total provisions		**1,379,223**	1,523,039
Payables			
Suppliers	10A	**140,913**	130,488
Grants	10B	**2,107,192**	1,863,319
Other program expenditure	10C	**137,552**	199,747
Total payables		**2,385,657**	2,193,553
TOTAL LIABILITIES		**3,764,880**	3,716,592
NET ASSETS		**343,776**	253,446
EQUITY			
Contributed equity		**-**	-
Reserves		**-**	-
Retained surplus		**343,776**	253,446
TOTAL EQUITY	11	**343,776**	253,446
Current Assets		**3,363,815**	3,189,480
Non-current Assets		**744,841**	780,557
Current Liabilities		**2,850,520**	2,649,633
Non-current Liabilities		**914,360**	1,066,959

The above statement should be read in conjunction with the accompanying notes.

AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURAL RESEARCH
STATEMENT OF CASH FLOWS
for the year ended 30 June 2005

	Notes	**2005** $	2004 $
OPERATING ACTIVITIES			
Cash received			
Goods and services		**20,088**	12,743
Appropriations		**47,648,000**	44,930,000
Interest		**2,756**	1,248
Net GST received from ATO		**3,053,062**	2,762,162
External Funds		**4,638,048**	4,306,846
Other		**59,268**	13,217
Total cash received		**55,421,222**	52,026,216
Cash used			
Employees		**5,026,929**	5,170,271
Suppliers		**3,532,175**	3,303,250
Net GST paid to ATO		**475,223**	316,925
Grants		**40,642,024**	37,286,991
Other program expenditure		**5,287,867**	5,844,819
Total cash used		**54,964,219**	51,922,256
Net cash from / (used by) operating activities	12	**457,003**	103,960
INVESTING ACTIVITIES			
Cash received			
Proceeds from sales of property, plant and equipment		**2,330**	1,890
Total cash received		**2,330**	1,890
Cash used			
Purchase of property, plant and equipment		**193,817**	101,290
Purchase of intangibles		**144,452**	1,650
Total cash used		**338,269**	102,940
Net cash (used by) investing activities		**(335,939)**	(101,050)
Net increase / (decrease) in cash held		**121,063**	2,910
Cash at the beginning of the reporting period		**459,370**	456,460
Cash at the end of the reporting period		**580,433**	459,370

The above statement should be read in conjunction with the accompanying notes.

AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURAL RESEARCH
SCHEDULE OF COMMITMENTS
as at 30 June 2005

	2005 $	2004 $
BY TYPE		
Other Commitments		
Operating leases[1]	**401,859**	1,001,136
Other commitments[2]	**59,034,787**	30,657,517
Total Other Commitments	**59,436,646**	31,658,653
Commitments Receivable	**(862,456)**	(478,171)
Net Commitments by Type	**58,574,191**	31,180,482
BY MATURITY		
All Net Commitments		
One year or less	**25,206,787**	18,215,878
From one to five years	**34,229,859**	13,442,774
Over five years	**-**	-
Net Commitments	**59,436,646**	31,658,652
Operating lease commitments		
One year or less	**401,859**	599,304
From one to five years	**-**	401,832
Over five years	**-**	-
Total Operating Lease Commitments	**401,859**	1,001,136

NB: Commitments are GST inclusive where relevant.

[1] Operating leases included are effectively non-cancellable and comprise:

- leases for office accommodation; and
- agreements for the provision of motor vehicles to senior executive officers.

[2] As at 30 June 2005, other commitments comprise amounts committed under grant agreements in respect of which the recipient is yet to either perform the services required, or meet eligibility conditions.

These have not been recognised as liabilities in the statement of assets and liabilities.

The above schedule should be read in conjunction with the accompanying notes.

AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURAL RESEARCH

SCHEDULE OF CONTINGENCIES

as at 30 June 2005

CONTINGENT LOSSES

There are no contingent losses.

CONTINGENT GAINS

There are no contingent gains.

SCHEDULE OF UNQUANTIFIABLE CONTINGENCIES

There are no unquantifiable contingencies.

AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURAL RESEARCH
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS
for the year ended 30 June 2005

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1. Summary of Significant Accounting Policies

1.1 Objectives of ACIAR

The Centre's mission is to achieve more productive and sustainable agricultural systems, for the benefit of developing countries and Australia, through international agricultural research partnerships. Developing countries are the major beneficiaries but there are also spin-offs for Australia. To achieve this goal, ACIAR facilitates and supports bilateral and multilateral research and development activities in a broad range of agricultural areas, including crops, animals, fisheries, forestry, land and water resources management, post-harvest technology, and economic studies of agricultural and natural resource utilisation.

The Centre is structured to meet one outcome:

> Agriculture in developing countries and Australia is more productive and sustainable as a result of better technologies, practices, policies and systems.

The outcome is identified under two outputs:

- Collaborative research that addresses agricultural and natural resource management problems of developing countries and Australia.
- Trained researchers in developing countries and Australia.

1.2 Basis of Accounting

The financial statements are required by section 49 of the *Financial Management and Accountability Act 1997* and are a general purpose financial report.

The statements have been prepared in accordance with:

- Finance Minister's Orders (or FMOs, being the *Financial Management and Accountability (Financial Statements for reporting periods ending on or after 30 June 2005))*;
- Australian Accounting Standards and Accounting Interpretations issued by the Australian Accounting Standards Board; and
- Consensus Views of the Urgent Issues Group.

The Statements of Financial Performance and Financial Position have been prepared on an accrual basis and are in accordance with historical cost convention, except for certain assets which, as noted, are at valuation. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

Assets and liabilities are recognised in the Statement of Financial Position when and only when it is probable that future economic benefits will flow and the amounts of the assets and liabilities can be reliably measured. However, assets and liabilities arising under agreements equally proportionately unperformed are not recognised unless required by an Accounting Standard. Liabilities and assets which are unrecognised are reported in the Schedule of Commitments.

Revenues and expenses are recognised in the Statement of Financial Performance when and only when the flow or consumption or loss of economic benefits has occurred and can be reliably measured.

The Centre is a Statutory Authority under the *Australian Centre for International Agricultural Research Act 1982*. The accounts have been prepared in accordance with that Act.

ACIAR is dependent on appropriations from the Parliament of the Commonwealth for its continued existence and ability to carry out its normal activities.

1.3 Revenue

The revenues described in this Note are revenues to the core operating activities of the Centre.

Revenues from Government - Appropriations

Departmental outputs appropriation for the year is recognised as revenue.

Other Revenue

Interest revenue is recognised on a proportional basis taking into account the interest rates applicable to the financial assets.

All other revenue is recognised when it is probable that the inflow of future economic benefits has occurred and they can be measured reliably.

1.4 Grants

The Centre makes grant payments under the *Australian Centre for International Agricultural Research Act 1982*.

All grant agreements require the grantee to perform services or provide facilities, or to meet eligibility criteria. In these cases, liabilities are recognised only to the extent that the services required have been performed or the eligibility criteria have been satisfied by the grantee. (Where grants moneys are paid in advance of performance or eligibility, a prepayment is recognised.)

1.5 Employee Benefits

Leave

The liability for employee benefits includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the Centre is estimated to be less than the annual benefit for sick leave.

The liability for annual leave reflects the value of total annual leave benefits of all employees at 30 June 2005 and is recognised at its nominal amount.

The long service leave liability for 2004-2005 has been calculated using a shorthand methodology using the following probability weightings for each band of completed years from years one to ten:

Completed Years of Service	Probability Weight
0-1	0.5
1-2	0.6
2-4	0.7
4-6	0.8
6-8	0.9
8+	1.0

The liability reflects the future cash outflows in net present terms by applying a 5% discount factor.

For annual leave the maximum of four weeks is recognised as a current liability. The balance of annual leave is treated as non-current.

The non-current portion of the liability for long service leave is recognised and measured at the present value of the estimated future cash flows to be made in respect of all employees at 30 June 2005. In determining the present value of the liability, attrition rates and pay increases through promotion and inflation have been taken into account.

Separation and Redundancy

No provision is made for separation and redundancy payments as the Agency has not formally identified any positions as excess to requirements.

Superannuation

Employees contribute to the Commonwealth Superannuation Scheme and the Public Sector Superannuation Scheme. Employer contributions amounting to $610,429 (2003-2004: $642,246) in relation to these schemes have been expensed in these financial statements.

1.6 Leases

A distinction is made between finance leases which effectively transfer from the lessor to the lessee substantially all the risks and benefits incidental to ownership of leased non-current assets and operating leases under which the lessor effectively retains substantially all such risks and benefits.

Where a non-current asset is acquired by means of a finance lease, the asset is capitalised at the present value of minimum lease payments at the inception of the lease and a liability recognised for the same amount. Leased assets are amortised over the period of the lease. Lease payments are allocated between the principal component and the interest expense.

Operating lease payments are expensed on a basis which is representative of the pattern of benefits derived from the leased assets.

1.7 Borrowing Costs

All borrowing costs are expensed as incurred except to the extent that they are directly attributable to qualifying assets, in which case they are capitalised. The amount capitalised in a period does not exceed the amounts of costs incurred in that period.

1.8 Cash

Cash means notes and coins held and any deposits held at call with a bank or financial institution. Cash is recognised at its nominal amount.

1.9 Financial Instruments

Accounting policies for financial instruments are stated at Note 17.

1.10 Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken

1.11 Property, Plant and Equipment

Asset Recognition Threshold

Purchases of property, plant and equipment are recognised initially at cost in the Statement of Financial Position, except for purchases costing less than $2,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

Revaluations

Basis

Infrastructure, plant and equipment have been revalued in accordance with the 'fair value' principles.

All infrastructure, plant and equipment assets were revalued in June 2003. The revaluation process was performed by the Australian Valuation Office.

There was no significant variation between the depreciated replacement value and their fair value. Accordingly, all assets are shown separately at their gross value and related accumulated depreciation.

Frequency

Infrastructure, plant and equipment are revalued progressively in successive three-year cycles. All current cycles commenced on 30 June 2003.

Conduct

All valuations are conducted by an independent qualified valuer.

Depreciation and Amortisation

Depreciable property plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the Centre using, in all cases, the straight line method of depreciation.

Depreciation/amortisation rates (useful lives) and methods are reviewed at each balance date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate. Residual values are re-estimated for a change in prices only when assets are revalued.

Depreciation and amortisation rates applying to each class of depreciable asset are based on the following useful lives.

	2005	2004
Plant and equipment	5-10 years	5-10 years
Computer Equipment	3 - 5 years	3 – 5 years
Intangibles	5-10 years	5-10 years

The aggregate amount of depreciation allocated for each class of asset during the reporting period is disclosed in Note 8.

1.12 Intangibles

Intangibles consist of proprietary software and are amortised over their useful lives, which range from 5 to 10 years.

All software assets were assessed for indications of impairment as at 30 June 2005. None were found to be impaired.

1.13 Taxation

The Centre is exempt from all forms of taxation except fringe benefits tax and the goods and services tax.

1.14 Insurance

The Centre has insured for risks through the Government's insurable risk managed fund called 'Comcover'. Workers compensation is insured through Comcare Australia.

1.15 Comparative Figures

Comparative figures have been adjusted to conform to changes in presentation in these financial statements in Note 18A.

1.16 Rounding

All amounts in these statements are shown in whole dollars.

2. Adoption of Australian Equivalents to International Financial Reporting Standards from 2005 - 2006

The Australian Accounting Standards Board has issued replacement Australian Accounting Standards to apply from 2005-06. The new standards are the Australian Equivalents to International Financial Reporting Standards (AEIFRS). The International Financial Reporting Standards are issued by the International Accounting Standards Board. The new standards cannot be adopted early. The standards being replaced are to be withdrawn with effect from 2005-06, but continue to apply in the meantime, including reporting periods ending on 30 June 2005.

The purpose of issuing AEIFRS is to enable Australian reporting entities reporting under the *Corporations Act 2001* to be able to more readily access overseas capital markets by preparing their financial reports according to accounting standards more widely used overseas.

AEIFRS contain certain additional provisions that will apply to not-for-profit entities, including Australian Government agencies. Some of these provisions are in conflict with IFRS, and therefore ACIAR will only be able to assert that the financial report has been prepared in accordance with Australian Accounting Standards.

AAS 29 *Financial Reporting by Government Departments* will continue to apply under AEIFRS.

Accounting Standard AASB 1047 *Disclosing the Impacts of Adopting Australian Equivalents to International Financial Reporting Standards* requires that the financial statements for 2004-05 disclose:

- an explanation of how the transition to AEIFRS is being managed;
- narrative explanations of the key policy differences arising from the adoption of AEIFRS;
- any known or reliably estimable information about the impacts on the financial report had it been prepared using AEIFRS;
- if the impacts of the above are not known or reliably estimable, a statement to that effect; and
- where an entity is not able to make a reliable estimate, or where quantitative information is not known, the entity should update the narrative disclosures of the key differences in accounting policies that are expected to arise from the adoption of AEIFRS

The purpose of this Note is to make these disclosures.

Management of the transition to AEIFRS

ACIAR has taken the following steps for the preparation towards the implementation of AEIFRS:

- The Agency's Audit Committee is tasked with oversight of the transition to and implementation of AEIFRS. The Chief Finance Officer is formally responsible for the project and reports regularly to the Audit Committee on progress against the formal plan approved by the Committee.
- The plan requires the following key steps to be undertaken and sets deadlines for their achievement.
- All major accounting policy differences between current AASB standards and AEIFRS were identified by 30 June 2004
- No system changes were necessary to be able to report under the AEIFRS, including those necessary to capture data under both sets of rules for 2004-
- A transitional balance sheet as at 1 July 2004 under AEIFRS was completed and presented to the Audit Committee on 28 April 2005.
- An AEIFRS compliant balance sheet as at 30 June 2005 was also prepared during the preparation of the 2004-05 statutory financial reports.
- The 2004-05 Balance Sheet under AEIFRS will be reported to the Department of Finance and Administration in line with their reporting deadlines.

Major changes in accounting policy

ACIAR believes that the first financial report prepared under AEIFRS ie at 30 June 2006, will be prepared on the basis that ACIAR will be a first time adopter under AASB 1 *First-time Adoption of Australian Equivalents to International Financial Reporting Standards.* Changes in accounting policies under AEIFRS are applied retrospectively i.e. as if the new policy had always applied except in relation to the exemptions available and prohibitions under AASB 1. This means that an AEIFRS compliant balance sheet has to be prepared as at 1 July 2004. This will enable the 2005-06 financial statements to report comparatives under AEIFRS.

A first time adopter of AEIFRS may elect to use exemptions under paragraphs 13 to 25E. When developing the accounting policies applicable to the preparation of the 1 July opening balance sheet, no exemptions were applied by ACIAR.

Changes to major accounting policies are discussed in the following paragraphs.

Management's review of the quantitative impacts of AEIFRS represents the best estimates of the impacts of the changes as at reporting date. The actual effects of

- continuing review of the impacts of AEIFRS on ACIAR operations;
- potential amendments to the AEIFRS and AEIFRS Interpretations; and
- emerging interpretation as to the accepted practice in the application of AEIFRS and the AEIFRS Interpretations.

the impacts of AEIFRS may differ from these estimates due to:

Property plant and equipment

It is expected that the 2005-06 *Finance Minister's Orders* will continue to require property plant and equipment assets to be valued at fair value in 2005-06.

Borrowing costs related to qualifying assets are currently capitalised. It is expected that the FMOs for 2005-06 will elect to expense all borrowing costs under AEIFRS. Accordingly, borrowing costs incurred during 2002-03 have been capitalised at 30 June 2003 with the associated qualifying asset.

The impact of this change on these financial statements is nil. No borrowing costs were capitalised during 2004-05.

Intangible Assets

ACIAR currently recognises software assets on the basis of cost. The carrying amounts include amounts that were originally measured at deprival valuation and subsequently deemed to be cost under transitional provisions available on the introduction of AAS 38 *Revaluation of Non-current Assets* in 2000-01 and AASB 1041 of the same title in 2001-02.

The Australian Equivalent on Intangibles does not permit intangibles to be measured at valuation unless there is an active market for the intangible. ACIAR has reviewed all intangibles and identified those assets where the cost could be verified. The remaining assets were based on a valuation. Accordingly, ACIAR will derecognise the revaluation component of the carrying amount of these assets on adoption of the Australian Equivalent.

The impact of the changes would have the effect of reducing the gross value of Intangible Assets by $118,915 and reducing Accumulated Amortisation by the same amount. Amortisation of intangibles is not expected to change on an annual basis and new acquisitions will replace those older assets.

Impairment of Intangibles and Property, Plant and Equipment

Under AEIFRS these assets will be subject to assessment for impairment and, if there are indications of impairment, an assessment of the degree of impairment. (Impairment measurement must also be done, irrespective of any indications of impairment, for intangible assets not yet available for use). The impairment test is that the carrying amount of an asset must not exceed the greater of (a) its fair value less costs to sell and (b) its value in use. 'Value in use' is the net present value of net cash inflows for cash generating units of the Agency and depreciated replacement cost for other assets which would be replaced if ACIAR were deprived of them.

The most significant changes are that, for the Agency's cash generating units, the recoverable amount is only generally to be measured where there is an indication of impairment. Previously all assets' recoverable amount was tested.

However, an impairment assessment of ACIAR's assets indicated that no adjustments will be required.

Decommissioning, Restoration and Make-good

When assessing accommodation leases for the preparation of the opening balance sheet, no obligations under the leases for make-good were determined.

Inventory

The new Australian Equivalent standard will require inventory held for distribution for no consideration or at a nominal amount to be carried at the lower of cost or current replacement cost.

ACIAR does not hold any inventory.

Employee Benefits

See Note 1.5

The provision for long service leave is measured at the present value of estimated future cash outflows using market yields as at the reporting date on national government bonds.

The 2003-04 Financial Report noted that the AEIFRS standards may require the market yield on corporate bonds to be used. The AASB has decided that a deep market in high quality corporate bonds does not exist and therefore national government bonds will be referenced.

AEIFRS require that annual leave that is not expected to be taken within 12 months of balance date is to be discounted. After assessing the staff leave profile, ACIAR does not expect that any material amounts of the annual leave balance will not be taken in the next 12 months. Consequently, there are no adjustments for non-current annual leave.

Administered Items

ACIAR does not have any administered items.

Financial Instruments

AEIFRS include an option for entities not to restate comparative information in respect of financial instruments in the first AEIFRS report. It is expected that Finance Minister's Orders will require entities to use this option. Therefore, the amounts for financial instruments presented in the ACIAR's 2004-05 primary financial statements are not expected to change as a result of the adoption of AEIFRS.

ACIAR will be required by AEFIRS to review the carrying amounts of financial instruments at 1 July 2005 to ensure they align with the accounting policies required by AEIFRS. It is expected that the carrying amounts of financial instruments held by ACIAR will not materially change as a result of this process.

Notes to and forming part of the Financial Statements

Reconciliation of Impacts – AGAAP to AEIFRS

	30 June 2005* $'000	30 June 2004 $'000
	$	**$**
Reconciliation of Departmental Equity		
Total Departmental Equity under AGAAP	**344**	253
Adjustments to accumulated results	**-**	-
Adjustments to other reserves	**-**	-
Total Equity under AEIFRS	**344**	**253**
Reconciliation of Departmental Accumulated Results		
Total Departmental Accumulated Results under AGAAP	**344**	253
Adjustments:		
Work in progress	**-**	-
Assets – Carrying Value	**-**	-
Asset Revaluation Reserves	**-**	-
Depreciation	**-**	-
Total Accumulated Results under AEIFRS	**344**	**253**
Reconciliation of Departmental Reserves		
Total Departmental Reserves under AGAAP	**-**	-
Adjustment:		
Asset Revaluation Reserve	**-**	-
Total Departmental Reserves under AEIFRS	**-**	**-**
Reconciliation of Departmental Contributed Equity		
Total Departmental Contributed Equity under AGAAP	**-**	-
Adjustments	**-**	-
Total Contributed Equity under AEIFRS	**-**	**-**
Reconciliation of Net surplus / (deficit) from ordinary activities for year ending 30 June 2005		
Total Departmental Reserves under AGAAP	**-**	
Adjustments:		
Depreciation and amortisation	**-**	
Write-down of assets	**-**	
Net surplus / deficit from ordinary activities under AEIFRS	**-**	

* 30 June 2005 total represents the accumulated impacts of AEIFRS from the date of transition.

3. Events Occurring After Reporting Date

There are no foreseeable financial effects of events or transactions after the reporting date which could materially affect Centre's financial position or operating performance for the next financial period.

4 . Operating Revenues

	2005 $	2004 $
4A - Revenues from Government		
Appropriations for outputs	**47,523,000**	46,832,000
Total revenues from government	**47,523,000**	46,832,000
4B - Goods and Services		
Goods	**16,107**	18,522
Total sales of goods and services	**16,107**	18,522
Provision of goods to:		
External entities	**16,107**	18,522
Total sales of goods	**16,107**	18,522
Costs of sales of goods	**3,174**	8,800
4C - Interest Revenue		
Interest on GST refunds	**2,756**	1,248
Total interest revenue	**2,756**	1,248
4D - Net Gain / (Loss) from Sale of Assets		
Infrastructure, plant & equipment:		
Proceeds from disposal	**2,204**	1,890
Net book value of assets disposed	**5,815**	2,861
Net gain / (loss) from disposal of infrastracture, plant and equipment	**(3,611)**	(971)
4E - Revenues from External Sources		
AusAID contributions	**3,646,438**	3,168,780
Industry contributions	**194,704**	14,776
Total revenues from external sources	**3,841,142**	3,183,556

5. Operating Expenses - Administration

	2005 $	2004 $
5A - Employee Expenses		
Wages and Salary	**3,948,537**	3,946,525
Superannuation	**610,429**	642,246
Leave and other entitlements	**90,769**	211,484
Separation and redundancies	**99,601**	5,072
Other employee expenses	**103,040**	99,377
Total employee benefits expense	**4,852,376**	4,904,704
Worker compensation premiums	**26,549**	25,128
Total employee expenses	**4,878,925**	4,929,832
5B - Supplier Expenses		
Goods from related entities	**9,534**	4,738
Goods from external entities	**204,639**	155,060
Services from related entities	**462,396**	482,699
Services from external entities	**2,059,184**	2,369,676
Operating lease rentals*	**593,469**	562,212
Total supplier expenses	**3,329,222**	3,574,385
* These comprise minimum lease payments only.		
5C - Depreciation and Amortisation		
Depreciation		
Other infrastructure, plant and equipment	**290,683**	263,527
Amortisation		
Intangibles - Computer Software	**50,801**	60,703
Total depreciation and amortisation	**341,484**	324,230
Leasehold improvements	**43,718**	43,387
Plant and equipment	**246,965**	220,140
Intangibles	**50,801**	60,703
Total depreciation and amortisation	**341,484**	324,230

6. Operating Expenses - Grants

	2005 $	2004 $
6A - Grants		
Non-profit institutions	**28,167,492**	25,586,156
Overseas entities	**9,974,197**	10,110,560
Total grants	**38,141,689**	35,696,716
6B - Other Program Expenditure		
Training	**2,565,098**	2,464,094
Communications research	**778,481**	753,677
Other research	**1,360,552**	2,249,278
Total other program expenditure	**4,704,131**	5,467,049

7. Financial Assets

7A - Cash		
Special Account	**580,433**	459,370
7B - Receivables		
Goods and services	**340,281**	26,967
Other Debtors	**7,577**	39,110
	347,858	66,077
GST receivable from the Australian Taxation Office	**462,782**	348,053
Undrawn appropriations	**1,777,000**	1,902,000
Total receivables	**2,587,640**	2,316,130
All receivables are current assets.		
Receivables (gross) are aged as follows:		
Not overdue	**2,530,640**	2,316,130
Overdue by:		
Less than 30 days	**57,000**	**-**
30 to 60 days	**-**	**-**
60 to 90 days	**-**	**-**
More than 90 days	**-**	**-**
Total Receivables (gross)	**2,587,640**	2,316,130

8. Non-Financial Assets

	2005 $	2004 $
8A - Infrastructure, Plant and Equipment		
Plant and equipment - at 2002-2003 valuation	**1,786,424**	1,644,048
Accumulated depreciation	**(1,239,330)**	(980,719)
Total Infrastructure, Plant and Equipment (non-current)	**547,094**	663,329
8B - Intangibles		
Computer software		
Purchased computer software	**536,167**	404,847
Accumulated amortisation	**(338,420)**	(287,619)
Total Intangibles	**197,747**	117,228

8C - Analysis of Property, Plant, Equipment and Intangibles

TABLE A
Reconciliation of the opening and closing balances of property, plant and equipment and intangibles

ITEM	Infrastructure, Plant and Equipment $	Computer Software $	TOTAL $
As at 1 July 2004			
Gross book value	1,644,047	404,847	**2,048,894**
Accumulated depreciation / amortisation	(980,718)	(287,619)	**(1,268,337)**
Opening Net book value	663,329	117,228	**780,557**
Additions:			
by purchase	180,263	131,320	**311,583**
Net revaluation increment / (decrement)	-	-	**-**
Depreciation / amortisation expense	(290,683)	(50,801)	**(341,484)**
Recoverable amount write-downs	-	-	**-**
Disposals	(37,886)	-	**(37,886)**
Write-off	-	-	**-**
As at 30 June 2005			
Gross book value	**1,786,424**	**536,167**	**2,322,591**
Accumulated depreciation / amortisation	**(1,239,330)**	**(338,420)**	**(1,577,750)**
Closing Net book value	**547,094**	**197,747**	**744,841**

8. Non-Financial Assets – cont

TABLE B
Assets at valuation

ITEM	Infrastructure, Plant and Equipment $	Computer Software $	TOTAL $
As at 30 June 2005			
Gross book value	1,786,424	536,167	**2,322,591**
Accumulated depreciation/amortisation	(1,239,330)	(338,420)	**(1,577,750)**
Net book value	547,094	197,747	**744,841**
As at 30 June 2004			
Gross value	1,644,048	404,847	**2,048,895**
Accumulated depreciation/amortisation	(980,719)	(287,619)	**(1,268,338)**
Net book value	663,329	117,228	**780,557**

8D - Prepayments	**2005** $	2004 $
Employees	**14,895**	16,191
Suppliers	**179,727**	50,102
Grants	**-**	344,600
Other program expenditure	**1,120**	3,088
Total	**195,742**	413,981

All other non-financial assets are current assets.

9. Provisions

9A - Employee Provisions		
Salaries and wages	**127,754**	66,896
Superannuation	**2,252**	-
Leave	**1,249,217**	1,456,143
Aggregate employee entitlement liability	**1,379,223**	1,523,039
Workers' compensation	**-**	-
Aggregate employee entitlement liability and related on-costs	**1,379,223**	1,523,039
Current	**614,862**	456,080
Non-current	**764,361**	1,066,959

10. Payables

10A - Supplier Payables		
Trade creditors	**140,913**	130,488
Total supplier payables	**140,913**	130,488
Supplier payables are represented by:		
Current	**140,913**	130,488
Non-current	**-**	**-**
Total supplier payables	**140,913**	130,488

Settlement is usually made net 30 days.

10B - Grants Payables		
Non-profit institutions		
ACIAR Projects	**343,691**	765,941
External Funded Projects	**1,763,501**	1,097,378
	2,107,192	1,863,319
10C - Other Program Payables		
Research Activities	**39,099**	131,377
Research Publications	**98,453**	68,371
Total other program payables	**137,552**	199,748

All payables are current liabilities.

11. Equity

ITEM	Accumulated Results		Asset Revaluation Reserves		TOTAL EQUITY	
	2005	2004	**2005**	2004	**2005**	2004
	$	$	$	$	$	$
Opening balance as at 1 July	**253,446**	174,775	**-**	-	**253,446**	174,775
Net surplus/deficit	**90,330**	78,671	**-**	-	**90,330**	78,671
Net revaluation increment/(decrement)	**-**	-	**-**	-	-	-
Transactions with owner:						
Distributions to owner:						
Returns on Capital						
Dividends	**-**	-	**-**	-	**-**	-
Returns of Capital						
Restructuring	**-**	-	**-**	-	**-**	-
Returns of contributed equity	**-**	-	**-**	-	**-**	-
Contributions by owner:						
Appropriations (equity injections)	**-**	-	**-**	-	**-**	-
Restructuring	**-**	-	**-**	-	**-**	-
Transfers to/(from)/between reserves	**-**	-	**-**	-	-	-
Closing balance as at 30 June	**343,776**	253,446	**-**	**-**	**343,776**	253,446

12. Cash Flow Reconciliation

	2005 $	2004 $
Reconciliation of cash per Statement of Financial Position to Statement of Cash Flows		
Cash at year end per Statement of Cash Flows	**580,433**	459,370
Statement of Financial Position items comprising above cash: 'Financial Asset - Cash'	**580,433**	459,370
Reconciliation of net surplus to net cash from operating activities:		
Net surplus/(deficit)	**90,330**	78,671
Depreciation/amortisation	**341,484**	324,230
Loss on sale of assets	**3,611**	971
(Increase)/decrease in net receivables	**(271,510)**	(1,216,853)
(Increase)/decrease in prepayments	**218,239**	(296,706)
Increase/(decrease) in supplier payables	**(51,769)**	124,828
Increase/(decrease) in employee provisions	**(143,816)**	(170,691)
Increase/(decrease) in grants payable	**243,873**	1,252,501
GST cash refund from financing and investing actvitites	**26,560**	7,009
Net cash from / (used by) operating activities	**457,003**	103,960

13. Contingent Liabilities and Assets

There are no remote contingencies.

14. Executive Remuneration

The number of executives who received or were due to receive total remuneration of $100,000 or more:	**2005**	2004
$180,001 - $190,000	**-**	1
$190,001 - $200,000	**-**	-
$200,001 - $210,000	**1**	1
$210,001 - $220,000	**1**	-
$220,001 - $230,000	**-**	-
$230,001 - $240,000	**-**	1
$240,001 - $250,000	**1**	-
$250,001 - $260,000	**-**	-
$260,001 - $270,000	**-**	-
	3	3
The aggregate amount of total remuneration of executives shown above.	**$672,097**	$625,432
The aggregate amount of separation and redundancy/termination benefit payments during the year to executives shown above.	**99,601**	Nil

The executive remuneration includes all officers concerned with or taking part in the management of the economic entity during 2004-05 including the Director.

15. Remuneration of Auditors

	2005	2004
	$	**$**
Financial statement audit services are provided free of charge to ACIAR.		
The fair value of the services provided was:	**24,000**	20,000

No other services were provided by the Auditor-General.

16. Average Staffing Levels

The average staffing levels for the Centre in 2004-2005 were 45 (FTE 42.04)
(2003-2004: 46.8 (44.87 FTE)).
A number of contract and locally engaged staff are engaged in Australian overseas missions.
In 2004-2005 the number was 21 (FTE 20.5) (2003-2004: 19.8 (18.55FTE)).

17. Financial Instruments

17A - Interest Rate Risk

				Fixed Interest Rate Maturing In			
		Floating Interest Rate		1 year or less		1 to 2 years	
Financial Instrument	Notes	**2005** $	2004 $	**2005** $	2004 $	**2005** $	2004 $
Financial Assets							
Cash at bank	7A	**-**	-	**-**	-	**-**	-
Receivables	7B	**-**	-	**-**	-	**-**	-
Total		**-**	-	**-**	-	**-**	-
Financial Liabilities							
Suppliers	10A	**-**	-	**-**	-	**-**	-
Grants	10B	**-**	-	**-**	-	**-**	-
Other program expenditure	10C	**-**	-	**-**	-	**-**	-
Total		**-**	-	**-**	-	**-**	-

		Non-Interest Bearing		Total		Weighted Average Effective Interest Rate	
Financial Instrument		**2005** $	2004 $	**2005** $	2004 $	**2005** %	2004 %
Financial Assets							
Cash at bank	7A	**580,433**	459,370	**580,433**	459,370	**n/a**	n/a
Receivables	7B	**2,587,640**	2,316,130	**2,587,640**	2,316,130	**n/a**	n/a
Total		**3,168,073**	2,775,500	**3,168,073**	2,775,500	**n/a**	n/a
Total Assets				**4,108,656**	3,970,038		
Financial Liabilities							
Suppliers	10A	**140,913**	130,488	**140,913**	130,488	**n/a**	n/a
Grants	10B	**2,107,192**	1,863,319	**2,107,192**	1,863,319	**n/a**	n/a
Other program expenditure	10C	**137,552**	199,747	**137,552**	199,747	**n/a**	n/a
Total		**2,385,657**	2,193,554	**2,385,657**	2,193,554	**n/a**	n/a
Total Liabilities				**3,764,880**	3,716,592		

17. Financial Instruments - cont.

17B - Net Fair Values of Financial Assets and Liablilites

The net fair values of each class of financial assets and liabilities equals the carrying amounts in both 2004 and 2005. Values are shown in the Statement of Financial Position

17C - Credit Risk Exposures

The entity's maximum exposures to credit risk at reporting date in relation to each class of recognised financial assets is the carrying amount of those assets as indicated in the Statement of Financial Performance.

The entity has no significant exposures to any concentrations of credit risk.

18. Appropriation

18A - Acquittal of Authority to Draw Cash from the Consolidated Revenue Fund (CRF) for Ordinary Annual Services Appropriations

Particulars	Departmental Outputs	
	2005	2004
	$	$
Year ended 30 June 2005		
Balance carried from previous year	**2,709,423**	1,511,711
Appropriation Act (No.1) 2004-2005	**47,523,000**	46,832,000
Appropriation Act (No.3) 2004-2005	**-**	-
Departmental Adjustments by the Finance Minister (Appropriation Act)	**-**	-
Comcover receipts (Appropriation Act s13)	**-**	-
Advance to the Finance Minister	**-**	-
Refunds credited (FMAA s30)	**-**	-
Sub total 2004-05 Annual Appropriation	**50,232,423**	48,343,711
Appropriations to take account of recoverable GST (FMAA s30A)	**3,167,791**	1,738,039
Annotations - revenue credited to Special Account	**4,722,489**	4,335,944
Total Appropriations available for payments	**58,122,703**	54,417,694
Cash payments made during the year (GST inclusive)	**55,302,488**	51,708,271
Appropriations credited to Special Accounts (excluding GST)	**-**	-
Balance of Authority to Draw Cash from the CRF for Ordinary Annual Services Appropriations	**2,820,215**	2,709,423
Represented by:		
Cash at bank and on hand	**580,433**	459,370
Receivable - departmental appropriations	**1,777,000**	1,902,000
Receivables - GST receivable from customers	**-**	-
Receivables - GST receivable from ATO	**514,601**	424,147
Payables - GST payable	**51,819**	76,094
Total	**2,820,215**	2,709,423

18B - Special Account

Legal authority: Financial Management and Accountability Act, 1997; s21
Purpose: for the receipt of all moneys and payment of all expenditure related to the operations of ACIAR.

This account is non-interest bearing

Particulars	Departmental Outputs	
	2005	2004
	$	$
Balance carried from previous year	**459,370**	456,460
Appropriation Act (No. 1) 2003-2004	**-**	44,930,000
Appropriation Act (No. 1) 2004-2005	**47,648,000**	
Other receipts		
Goods - Provision of goods to related entities	**22,418**	14,633
Services - Rendering of services to related entities	**4,700,071**	4,321,311
GST credits (FMAA s30A)	**2,577,839**	2,445,237
Available for payments	**55,407,698**	52,167,641
Payments made to employees	**(5,026,929)**	(5,170,271)
Payments made to suppliers	**(49,800,336)**	(46,538,001)
Balance carried to next year	**580,433**	459,370
Represented by:		
Cash - held by ACIAR	**580,433**	459,370
Receivables - GST receivable from customers		
Receivables - Net GST receivable from the ATO		
Other Payables - Net GST payable to the ATO		
Payable - Suppliers - GST portion		
Total balance carried to the next period	**580,433**	459,370

ACIAR has an *Other Trust Monies Special Account* and a *Services for other Governments and Non-Agency Bodies Account*. For the years ended 30 June 2002-2005 both special accounts had nil balances and there were no transactions debited or credited to them.

The purpose of the *Other Trust Monies Special Account* is for expenditure of monies temporarily held on trust or otherwise for the benefit of a person other than the Commonwealth.

The purpose of the *Services for other Government And Non-Agency Bodies Special Account* is for expenditure in connection with services performed on behalf of other Governments and bodies that are not under the *Financial Management and Accountability Act 1997*.

19. Reporting by Outcome

ACIAR costs have been attributed between the outputs on the basis of direct program expenditure and salary costs plus a proportion of other running costs based on staff numbers. The basis of attribution in this table is consistent with the basis used for the 2004-05 Budget.

19A - Net Cost of Outcome Delivery

	Outcome 1	
	2005	2004
	$	$
Departmental expenses	**51,401,266**	49,995,073
Total expenses	**51,401,266**	49,995,073
Cost recovered from provision of goods and services to the non-government sector		
Departmental	**16,107**	18,522
Total cost recovered	**16,107**	18,522
Other external revenues		
Departmental revenues		
Interest	**2,756**	1,248
Revenue from disposal of assets	**2,204**	1,890
Other	**106,387**	36,528
Goods and Services Revenue from Related Entities	**3,841,142**	3,183,556
Total other external revenues	**3,952,489**	3,223,222
Net cost/(contribution) of outcome	**47,432,671**	46,753,329

19B - Major Classes of Departmental Revenues and Expenses by Output Group

Outcome 1	Output 1.1		Output 1.2		Total	
	2005	2004	**2005**	2004	**2005**	2004
	$	$	**$**	$	**$**	$
Departmental expenses						
Employees	**4,635,385**	4,700,981	**243,540**	228,851	**4,878,925**	4,929,832
Suppliers	**3,163,038**	3,408,457	**166,184**	165,929	**3,329,222**	3,574,386
Depreciation & Amortisation	**324,438**	309,179	**17,046**	15,051	**341,484**	324,230
Grants	**38,141,689**	35,696,716	**-**	-	**38,141,689**	35,696,716
Other Program Expenditure	**2,139,033**	3,002,955	**2,565,098**	2,464,094	**4,704,131**	5,467,049
Other	**5,815**	2,861	**-**	-	**5,815**	2,861
Total departmental expenses	**48,409,398**	47,121,149	**2,991,868**	2,873,925	**51,401,266**	49,995,074
Funded By:						
Revenues from government	**44,987,000**	44,353,000	**2,536,000**	2,499,000	**47,523,000**	46,852,000
Sale of goods and services	**16,107**	18,522	**-**	-	**16,107**	18,522
Other non-taxation revenue	**3,952,489**	3,203,222	**-**	-	**3,952,489**	3,203,222
Total departmental revenues	**48,955,596**	47,574,744	**2,536,000**	2,499,000	**51,491,596**	50,073,744