



Australian Government

Australian Centre for International Agricultural Research

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IN RESEARCH FOR
DEVELOPMENT

AID EFFECTIVENESS

EXPORTING THE SCIENTIFIC METHOD

TRADE IS THE MISSING LINK

BENEFITS TO AUSTRALIA

Effective aid changes lives

In recent months there has been a focus on aid and effectiveness, prompted by the Australian Government's response to the Independent Review of Aid Effectiveness. The response—*An Effective Aid Program for Australia: Making a real difference, delivering real results*—sets out how Australian aid will deliver real results for poor people in developing countries by maximising the effectiveness of Australia's aid.

The government's response endorses the view of the aid review, that agricultural research is an important facet of Australia's overall aid program. *An Effective Aid Program for Australia: Making a real difference* recognises that "agricultural research remains an important driver of agricultural productivity".

ACIAR's role is central to delivering the productivity gains that improve food security and catalyse broader economic growth, as reported on page 4. The government's response acknowledges the "impressive results, confirmed by independent evaluations" that ACIAR has achieved.

An Effective Aid Program for Australia: Making a real difference also notes Australia's increasing contribution to the centres of the Consultative Group on International Agricultural Research (CGIAR). Australia supports the work of important global research bodies such as those of the CGIAR, as this furthers our leadership role in delivering food security.

The articles on pages 20 and 23 detail some of ACIAR's partnerships with the CGIAR. The second of these articles is an interview with the Director of the International Wheat and Maize Improvement Center (CIMMYT), which is leading ACIAR's multi-country food initiative in eastern Africa.

**The government's response acknowledges the
"impressive results, confirmed by independent evaluations"
that ACIAR has achieved.**

Australia's support for multilateral institutions is a key pillar in responding to the impact of rising global food prices on poor people. Australian aid is an active contributor to the work of the G20 on food security. We contributed \$50 million to the World Bank's Global Food Crisis Response Fund at the peak of the crisis in 2008, and Australia was an early and major supporter of the Global Agriculture and Food Security Program (\$50 million). These programs provide safety nets for the poor, such as supplying food for work and helping to support agricultural production.

On page 10, *Partners* reports on how ACIAR projects are linking smallholder farmers to markets. *An Effective Aid Program for Australia: Making a real difference* notes the role of agricultural subsidies in damaging food security. Aid can only achieve so much when set against the harmful long-term impacts that such restrictive trade practices have on poor countries.

Responding to changing global trade patterns and supporting the potential of open trade to lift smallholders out of poverty is part of delivering effective aid outcomes to smallholders engaged in agriculture.

ACIAR's impressive results have in part been delivered through participatory research approaches that engage both scientists and smallholders. The articles on pages 12 and 16 highlight some of these successes, explaining how ACIAR's approaches deliver these outcomes.

Achieving lasting food security for the world's poor engaged in agriculture will require continued successes. ACIAR's work to improve food security contributes to the five key goals of the aid program, particularly sustainable economic development.

Through productivity gains to improve incomes, employment and enterprise opportunities, and reducing barriers to market entry for smallholders, opportunities are created and lives are saved. Productivity gains and diversity in agricultural systems help build resilience, can create savings and strengthen against shocks. Capacity building within agricultural research and extension services of partner governments strengthens governance structures.

ACIAR will continue to work to improve food security and contribute to an effective aid program, and in doing so will continue to change smallholder lives for the better.

This issue...

- Effective aid is good foreign policy** 4
Australia's Foreign Minister, Kevin Rudd, recently outlined the Australian Government's response to the Independent Review of Aid Effectiveness in Australia.
- The Australian International Food Security Centre** 7
- Trade goes back to the future** 8
Globalised trade between geographically dispersed groups is the aim of free trade advocates, and the hope of a better future for many. But this idea is not new.
- Smallholders getting more for their teak** 10
Teak production and furniture manufacture is a major industry in Java, Indonesia, but with production from the natural forests in decline smallholders are being assisted to help meet demand.
- Overseas aid a fair trade** 12
Australia's competitive research funding model is helping developing countries deliver on mandates to improve agriculture with important rebound benefits.
- Mutual gains on waterlogged and saline soils** 15
- Innovation reaps food security rewards** 16
Smallholder farmers face a range of challenges in adopting new practices developed through agricultural research. An understanding of the socioeconomic and human factors constraining adoption can help in this transition.
- Work for world's poor improves Australia's crop fortunes** 20
Australia's long-standing partnership with the CGIAR's agricultural research centres, aimed at alleviating poverty in the developing world, has also reaped many benefits on home soil.



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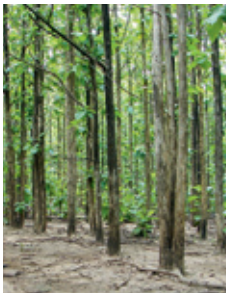
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PARTNER COUNTRIES

- INDIA, page 15
- CAMBODIA, page 12
- THE PHILIPPINES, page 16
- PACIFIC ISLANDS, page 25
- INDONESIA, pages 8, 10, 12
- PAPUA NEW GUINEA, page 16
- TANZANIA, page 8
- SOUTH AFRICA, pages 8, 19



The second Green Revolution 23
 The way the world is expected to look in 2050 preys on the mind of Dr Thomas Lumpkin as the CIMMYT Director General oversees efforts to raise farm productivity and sustainability in the face of daunting challenges.

Indigenous knowledge sharing 25
 ACIAR recently hosted a forum looking at ways of increasing knowledge transfer between indigenous communities world-wide.

ACIAR round up

- Innovative charcoal stove for PNG 26
- World Congress on Conservation Agriculture 26
- ACIAR Policy Advisory Council visit 27
- Impact assessment workshop in the Philippines 27
- East Timor PhD graduate 28
- Blueprint for improving Indonesian farmers' welfare 28
- John Allwright Fellows gather 29

ACIAR what's new

- New staff 29
- New publications 30
- New projects 31
- Events 31

partners
 IN RESEARCH FOR DEVELOPMENT



Partners in Research for Development is the flagship publication of the Australian Centre for International Agricultural Research (ACIAR). Partners presents articles that summarise results from ACIAR-sponsored research projects and puts ACIAR research initiatives into perspective. Technical inquiries will be passed on to the appropriate researchers for reply. Reprinting of articles, either whole or in part, is welcomed provided that the source is acknowledged.

This publication is freely available from ACIAR's website at <aciar.gov.au>. It is also freely available on request from ACIAR. The use of a trade name does not constitute any endorsement of, or discrimination against, any product by ACIAR.

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EFFECTIVE AID IS GOOD FOREIGN POLICY

Australia's Foreign Minister, Kevin Rudd, recently outlined the Australian Government's response to the Independent Review of Aid Effectiveness in Australia.

BY ALEXANDRA BAGNARA

Following the recent Independent Review of Aid Effectiveness the Australian Government has outlined its response. The report, *An Effective Aid Program for Australia: Making a real difference—Delivering real results*, outlines the directions for Australian aid.

The fundamental purpose of the program is to help people overcome poverty. This also serves Australia's national interests by promoting stability and prosperity both in our region and beyond. Effort is focused on areas where Australia can make a difference and where the country's resources can be deployed most effectively and efficiently.

Speaking at the launch of the Government's response, the Minister for Foreign Affairs, Kevin Rudd, emphasised the three core principles of Australian aid:

- that poverty eradication is our core objective;

- that as well as being the right thing to do, it is in our national security interests; and
- we focus on those areas where we can make a real difference.

"In doing so, we align ourselves with the Millennium Development Goals," Minister Rudd said.

"One point four billion members of the human family (one-fifth of our number) today suffer the degradation of poverty. And two-thirds of these are within our region. We believe it is right to do what we can to help our fellow human beings out of poverty—because as Australians it is not in our nature to be indifferent to the sufferings of others," he said.

ACIAR plays a modest, strategic role in promoting stability and prosperity, both in our region and beyond, through improving food security.

ACIAR delivers Australian expertise in agricultural research, which significantly

contributes to sustainable economic development in agriculture—the largest sector in most developing country economies.

The aid program has five strategic goals (see page 6) to which ACIAR contributes. Its key contribution is to the goal of sustainable economic development and specifically the first development objective within this goal: improving food security by investing in agricultural productivity, infrastructure protection and the opening of markets.

Transferring new knowledge, technologies and approaches to the agricultural sectors of developing countries has significant potential to achieve productivity gains and surpluses, which in turn lift incomes and reduce poverty. These gains also create opportunities in other sectors by freeing-up labour and generating growth in communities.

The International Fund for Agricultural Development reports that gross domestic



Rice farmers in Laos.

PHOTO: PAUL JONES

product (GDP) growth generated by agriculture can be up to four times more effective in reducing poverty than growth generated by other sectors.

ACIAR's focus is on food security, delivered through research that helps smallholder farmers overcome barriers to adoption.

In a speech for Anti-Poverty Week, Minister Rudd referred to the ACIAR Seeds of Life project in East Timor. By boosting crop yields with no extra inputs, the project was an example of the sustainable economic development to which the aid program aspires.

"That is the difference between, frankly, subsistence agriculture to a level of agriculture which becomes genuinely self-sustaining, and even the possibility of selling at market," Minister Rudd said.

This change is demonstrated in the story of Maria Elena Castro Soares who, with her husband, struggled to feed their 10 children

prior to becoming involved in Seeds of Life. In 2005 she received five kilograms of rice from a Seeds of Life project officer. Today, she and her family have earned enough from the surpluses gained from the improved rice variety to pay for schooling for their children and for farm labour. They have also been able to start a small kiosk business with the remaining funds.

This is one example of how ACIAR, through delivering improved food security, is helping transform the lives of smallholders. Many other smallholders have similar stories to tell from their involvement with ACIAR projects.

GOVERNMENT RESPONSE TO THE AID REVIEW

The Australian Government is committed to lifting its aid funding to 0.5 per cent of gross national income (GNI) by 2015–16.

In November 2010, Minister Rudd announced an Independent Review of Aid

Effectiveness so that Australians would know that the increased funding was improving the lives of the poor. The review was a forward-looking exercise, with the Government's response released in July 2011.

The review found that Australia has a good aid program and is an effective performer by global donor standards. The Government's response agreed, or agreed in principle, to 38 of the 39 recommendations. Cabinet has noted one further recommendation on the name of the portfolio, which will be considered at a later date.

PURPOSE OF AUSTRALIAN AID

The fundamental purpose of Australian aid is to help people in developing countries overcome poverty. This also serves Australia's national interests by promoting stability and prosperity in our region and beyond. Effort is focused on areas where Australia can make a difference and where the country's resources can be deployed most effectively and efficiently.

FOCUS OF AUSTRALIAN AID

Consistent with the Millennium Development Goals, Australia's aid program is guided by five core strategic goals, reinforced by 10 individual development objectives.

1 Saving lives

- Improving public health.
- Improving the lives of women and children through greater access to quality services.

2 Promoting opportunities for all

- Enabling more children, particularly girls, to attend school.
- Empowering women.
- Enhancing the lives of people with disabilities.

3 Sustainable economic development

- Improving food security.
- Improving incomes, employment and enterprise opportunities for poor people.
- Reducing negative impacts of climate change and environmental factors on poor people.

4 Effective governance

- Improving governance to deliver services, improve security and enhance justice and human rights for poor people.

5 Humanitarian and disaster response

- Enhancing disaster preparedness and delivering faster and more effective responses to humanitarian crises.



Geographically, as recommended in the Independent Review of Aid Effectiveness, the Asia-Pacific region—including our nearest neighbours Indonesia, Papua New Guinea and East Timor—remains the primary focus of Australia's efforts. This is where Australia has strong ties and experience, and where the

international community expects us to play a lead role. It is also where Australia's economic and security interests are most closely engaged.

At the same time, Australia will increase aid to South Asia and Africa. As a growing middle power, we cannot claim to be tackling global

poverty without increasing our investment in the world's two most impoverished regions.

The aid program will continue to play its part in international efforts to bring development to Afghanistan and Pakistan. We will also provide targeted support elsewhere. ■

Our purpose

THE FUNDAMENTAL PURPOSE OF AUSTRALIAN AID IS TO HELP PEOPLE OVERCOME POVERTY

The fundamental purpose for the program is to help people overcome poverty. This also serves Australia's national interests by promoting stability and prosperity both in our region and beyond. We focus our effort in areas where Australia can make a difference and where our resources can most effectively and efficiently be deployed.

ACIAR plays a modest, strategic role in promoting stability and prosperity both in our region and beyond through improving food security. We deliver Australian expertise in agricultural research which significantly contributes to sustainable economic development in agriculture – the largest sector in most developing country economies.

Our strategic goal – improving food security

By improving food security ACIAR also contributes to the strategic goals of the Australian official development assistance program.

| | | | | |
|--|---|---|---|---|
| SAVING LIVES Delivering productivity gains to increase smallholder farmers' income, providing a means to access healthcare | PROMOTING OPPORTUNITIES FOR ALL Reducing on-farm labour requirements Delivering productivity gains to increase smallholder farmers' income, providing a means to access education Design of gender-specific approaches to empower women | SUSTAINABLE ECONOMIC DEVELOPMENT Delivering sustainable productivity gains to improve incomes, employment and enterprise opportunities, and reducing barriers to market entry for smallholders Reducing the negative impacts of climate change and other environmental factors through adaptation and mitigation within agricultural systems | EFFECTIVE GOVERNANCE Sustainable capacity building within agricultural research and extension services of partner governments Capacity building for policy makers within partner governments | HUMANITARIAN AND DISASTER RESPONSE Building more robust and resilient farming systems better able to adapt to shocks and stresses |
|--|---|---|---|---|

How ACIAR delivers aid efficiently and effectively

| | | | | |
|--|--|--|---|--|
| A CLEAR STRATEGY Annual Operational Plans aligned with Official Development Assistance (ODA) and partner priorities Project reporting and review cycles | VALUE FOR MONEY AND CONSOLIDATION Alignment of Australian expertise with partner country needs Integrated project portfolio | RISK MANAGEMENT AND PERFORMANCE OVERSIGHT Consultation with partner countries Program managers deploying scientific and management expertise in project design and delivery | TRANSPARENCY AND RESULTS Annual Operational Plans and published project progress reports \$31.9 billion in impacts measured by independent analyses of projects Independent impact assessment program | INVOLVING THE AUSTRALIAN COMMUNITY Partnerships with Australian research organisations |
|--|--|--|---|--|

Asphilon Nyaga of Embu, Kenya, with recently harvested maize from her farm. The maize was grown in a SIMLESA project trial of growing maize and beans using conservation agriculture techniques on her farm.



PHOTO: M. GYLES

THE AUSTRALIAN INTERNATIONAL FOOD SECURITY CENTRE

BY SAMANTHA WILLIAMS

During the Commonwealth Heads of Government Meeting in October 2011, the Australian Government announced support for the establishment of an Australian International Food Security Centre (AIFSC).

The AIFSC has a broad international focus, recognising the significance of food security to developing countries across Africa, Asia and the Pacific. Initial emphasis will be given to Africa, where the highest proportion of the population live in poverty.

The AIFSC is embedded in the Australian Centre for International Agricultural Research (ACIAR) and will operate to create linkages initially between African researchers and their Australian counterparts, extending participation to co-investors and international agricultural research institutions.

Research will be focused on boosting the productivity of smallholder farmers, helping them improve livelihoods in a sustainable manner and having an impact on global food security. The AIFSC aims to:

- support smallholder-driven research partnerships to tackle clearly articulated, major food security challenges that require medium to long-term collaborative efforts
- stimulate broader education and training in international agriculture
- provide a global portal for access to Australian research, technical and policy expertise programs and linking a range of

Australian, African and international research and development agencies, and

- facilitate collaboration of businesses and researchers, including private and public sector organisations, industry associations and multilateral agencies.

PROGRESS TO DATE

Working groups have been established and are making progress on work to establish governance, strategy, partnerships, communications and operational structures. The AIFSC will also hold a conference in the middle of 2012 to define opportunities for collaboration and partnerships.

Immediate steps have been taken to recruit a director for the centre to lead associated staff. ACIAR is also developing a partnership strategy for the AIFSC to ensure it builds strong international links with relevant institutions, including links between Australian and African research institutions. A decision on a suitable office in Africa will be taken as a later step.

A decision on geographical focus has not been made, but will take into account factors such as poverty, national interest, current scale and effectiveness, and the capacity to make a difference.

The Forum for Agricultural Research in Africa (FARA) is engaged in the design phase, and the AIFSC is exploring collaboration with potential partners including the International

Development Research Centre (IDRC) of Canada and the US Agency for International Development (USAID).

Preparations are underway for an international conference on African food security. ACIAR will undertake advocacy activities to promote stakeholder involvement and participation, particularly among African institutions, including through related G20 agricultural research initiatives, which will help build momentum towards the establishment of the centre.

PROVIDE INPUT OR REGISTER INTEREST

There is a great deal of interest in the AIFSC, not only from African countries but from Asia-Pacific partners as well.

Interested parties are being directed to view the information on the AIFSC page of the ACIAR website (aciar.gov.au/aifsc) and can register their interest there in becoming involved.

The level of interest from Australian universities and agricultural and aid organisations reflects that in partner countries. ■

MORE INFORMATION

Australian International Food Security Centre,
aciar.gov.au/aifsc

To get involved in the AIFSC,
aciar.gov.au/aifscconsultation



Farmers in Limpopo province in South Africa have benefited from ACIAR-supported research to gain access to the beef market for their indigenous breeds of cattle.



Javanese snackfood manufacturer Ida Rosida prepares potato chips for delivery to urban outlets. She recently applied for a bank loan to acquire larger-scale machinery to meet increasing market demand.

Trade goes back to the future

Globalised trade between geographically dispersed groups is the aim of free trade advocates, and the hope of a better future for many. But this idea is not new.

KEY POINTS:

- **Helping smallholders produce surpluses is not enough to help rural communities out of poverty.**
- **To achieve sustainable developmental gains, ACIAR examines the realities for smallholders of global trade in the 21st century.**
- **By assimilating lessons about value chains, trade policy and smallholder agribusinesses, a suite of ACIAR projects is overcoming barriers to market access.**

BY WARREN PAGE

The Silk Road is a millennia-old trade route linking China to the Mediterranean—overland through central Asia and by sea along the coastlines of South-East Asia, India and eastern Africa. The term ‘Silk Road’, first coined by the German geographer Ferdinand von Richthofen in the 1800s, is today viewed with nostalgia and romanticism. However, trade along the routes of the Silk Road continues, and has the potential to reshape the world economy.

Many of the world’s emerging economies, and those with the greatest growth potential, are linked by Silk Road routes between China and Africa. In these developing countries and emerging economies are found many of the world’s poorest people, including hundreds of millions of smallholder farmers.

The idea of trade is important to the hope they share of a better life. Creating surpluses to secure food supply is the beginning. The next step is to link these farmers and their surpluses to markets, and to a growing globalised trade community.

However, there are barriers standing in the way of their inclusion in the value chains that supply markets.

SMALL TRADERS EMERGE

Of all those who benefited from the flow of goods along the Silk Road it was traders who reaped the largest profits. For smallholders today one of the main barriers is accessing information from potential suppliers and supply

chains, without relying on those who profit from controlling the space between farmers and buyers.

This challenge for smallholders is two-fold: finding information that is timely and accurate, and understanding how to meet the needs of buyers.

Felista Mateo, a farmer from Tanzania, had no way of tracking market prices if she produced a surplus. The lack of consistent productivity left Felista reliant on the middlemen prepared to buy her occasional surpluses at a price of their choosing. Her involvement in ACIAR’s sustainable maize and legume project (SIMLESA) has ensured more consistent surpluses. It has also helped change the dynamic with the middlemen.

The SIMLESA project has established a support network that includes checks on market prices. Felista can now call the local extension service and get price information to make an informed judgment.

Elsewhere on the continent, farmers too are benefiting, this time from breaking through a major market barrier—quality. Emerging farmers in Limpopo province in South Africa have benefited from ACIAR-supported research to gain access to the beef market for their indigenous breeds of cattle.

Meat is popular in South Africa, with most cattle ‘finished’ in feedlots. Despite smallholders holding a 60% share of all cattle, the commercial sector used to supply more than 90% of all cattle to feedlots. Those ratios are gradually changing.

Smallholder farmers were largely closed



Felista Mateo, from Kilima Tembo village, Tanzania, is participating in ACIAR's maize and legume (SIMLESA) project.

out of the market, partly due to prejudices built up during the apartheid era. However, a dearth of information on the beef quality of the indigenous breeds managed by smallholders—and the lack of experience of this group of farmers in marketing their cattle—were the greater barriers in post-apartheid South Africa.

ACIAR's research, in conjunction with Australia's Beef Cooperative Research Centre and South Africa's Agricultural Research Council, shattered the notion that indigenous cattle provided inferior-quality beef. Controlled feeding experiments under feedlot conditions revealed that indigenous varieties and commercial varieties of cattle produced beef of equal commercial quality.

The remaining challenge has been applying these findings to change perceptions among commercial feedlot owners, beef buyers and consumers, all of who are realising that indigenous beef is as good as beef from commercial breeds. A key aspect of this work looks at customising supply chains to improve the commercial viability of the smallholder sector. This involves another change in thinking, with smallholders becoming agribusiness operators themselves.

THE BUSINESS OF FARMING

Agribusiness is a term often associated with larger commercial entities that own the supply chain, from farm gate to supermarket. In order to gain entry to those chains, smallholders need to understand what those businesses want from suppliers. So it is no coincidence that a business approach is an important part

of smallholders ensuring their farm gates are among those visited by agribusinesses.

Ida Rosida, from West Java in Indonesia, is among those who has made the transition from smallholder to business, selling potato chips. She was aided by involvement in an ACIAR–International Potato Center project that focused on market chains, using participatory approaches to sell innovations.

Ida has created a niche, demonstrating that smallholders can transition to agricultural business operators in their own right. These transitions are likely to help expand and develop a new Silk Road in the near future.

TRADE-OFFS TO TRADE UP

The Southern Silk Road is used to describe the growing pattern of trade to and from Asia. Unlike the old Silk Road that linked Europe to China, the Southern Silk Road links China with Africa and South America.

South–South economic growth is gaining momentum, redrawing the trade routes of old. A new report, *The Southern Silk Road: Turbocharging 'South-South' economic growth*, by the HSBC Group, describes how the patterns that fuelled the growth in developed-world trade in the 1950s and 1960s are now within reach of developing nations.

The report cites the key trend away from developing, or 'South', countries relying solely on exports to the developed countries. Instead it states that: "the western nations, however, are simply not growing fast enough to enable this model to be sustained. If the emerging nations are going to experience living standards

approaching those now taken for granted in the developed world, they will increasingly have to trade with each other."

The realities of global trade in the 21st century create both opportunities and disadvantages for smallholder farmers. Integration into globalised trade may seem distant, but it begins with smallholder farmers having the skills to enter local trade networks.

These inevitably have their own set of rules, as do regional networks within countries. Quality characteristics are an example of rules, set by participants in value chains; fail to meet these criteria and entry to the chain is denied.

Where once these were set and enforced by middlemen with little explanation of why prices varied, it is increasingly a mix of larger players and governments that are defining how trade operates. The World Trade Organization (WTO) too has its own set of rules and regulations for inter-country trade. WTO accession sees governments bound to those regulations.

Understanding these rules, operating within them and, where needed, changing those rules that unfairly exclude otherwise eligible players, is important for smallholders and businesses alike. A rules-based trade order is important to Australia's interests, particularly in agriculture, where Australian exports feed an estimated 40 million people beyond our borders. Trade is in the interests of these people and in offering smallholders avenues to sell their surpluses.

It is also in the interests of all those countries engaging in trade. As China and other countries on the Silk Road established order through a string of guardhouses, today many governments are looking to trade rules to create similar security in trade.

A suite of ACIAR projects has examined the relationships between trade, WTO accession and policy settings to ensure smallholder farmers are not left behind.

This research works in part to help mirror trade rules at the smallholder level, by linking farmers to markets, helping achieve quality standards and influencing policymakers to create a supportive environment. Doing so creates the means to link these smallholder traders into the prosperity of larger trading networks, whether at the village, regional or global level.

A new Southern Silk Road is likely to emerge, with or without smallholders. The linkages of trade are multifaceted and can result in market opportunities at the micro level, and encourage the flow through to global trade as stronger economies emerge.

Felista, Ida and the indigenous cattle farmers of South Africa are just a few of the emerging traders who stand to benefit from the creation of new trade routes, including a new Silk Road. ■

SMALLHOLDERS GETTING MORE FOR THEIR TEAK

Teak production and furniture manufacture is a major industry in Java, Indonesia, but with production from the natural forests in decline smallholders are being assisted to help meet demand.

KEY POINTS:

- **Silvicultural technologies that improve returns for smallholder teak producers have been introduced in Indonesia.**
- **Participation in profitable teak production can be enhanced through the provision of farmer-run micro-financing schemes.**
- **Improved understanding of timber markets by smallholder teak producers will enhance their returns.**

BY KATE LANGFORD

Prized for its strength, colour and appearance, teak is a valuable timber used in furniture, housing materials and boats, and by artisans. The demand for teak continually outstrips supply. So why is it that most of the three million Indonesian smallholder farmers who grow teak are not profiting as much as they should?

According to James Roshetko, leader of the Trees and Markets unit of the World Agroforestry Centre in South-East Asia and from Winrock International, there are three main reasons: poor silvicultural techniques that result in low-quality timber, limited market knowledge and lack of capital.

Helping farmers to get maximum benefit from their teak was the aim of an ACIAR-funded project that ran from 2007–11, working with eight villages in the district of Gunungkidul, near the ancient capital of Yogyakarta.

In the 1950s Gunungkidul was among the most degraded districts in Indonesia, with just 3% forest cover. Today more than 42,000 hectares, or about 28%, is covered by forest, 69% of which is smallholder agroforests dominated by teak plantations.

“Gunungkidul district was chosen for the project because of this rapid increase in teak planting, but the lessons learned here can be applied in many other places,” says Dede Rohadi, project leader from the Center for International Forestry Research (CIFOR).

Teak was brought to Indonesia by Hindu missionaries as early as the second century. During Dutch colonisation, intensive plantations were established and later transferred to a state-owned company at independence. The supply of teak from these large plantations is unable to meet the demand from Javanese furniture makers; more and more comes from smallholder plantations.

The majority of farmers who grow teak use it as an emergency savings account. When

there is need for money—for a marriage or school fees—the farmer can sell a tree and have ready cash.

Mr Roshetko points out that there is far greater potential for teak to improve livelihoods than is currently realised. “We wanted to find ways of making teak more profitable and these have to be grounded in the realities of smallholder production systems.”

The first hurdle relates to the way timber is currently grown on farms—the silvicultural techniques. Most farmers either grow teak in woodlots (known locally as *kitren*) or they plant the trees among their agricultural crops (*tegalan*). In both cases, the trees are given little additional management during their life.

“Current practices use poor germplasm and tend to lead to overstocking, so the teak grows slowly and the timber quality is poor,” Mr Roshetko says.

By establishing six farmer demonstration trials, the project exhibited proper thinning and pruning over several years. These techniques can increase the diameter of the teak tree by 60% and the height by 124%. About 450 farmers received silvicultural training through these trials, and more than half of them have now adopted the improved techniques.



Measuring harvested timber to gauge expected returns.



Timber quality is an important determinant of which logs to harvest.

Forestry extension officers, non-government organisation (NGO) workers and district government officers have received a manual in Bahasa with practical guidelines on the use of improved teak planting stock and proper pruning techniques.

While it's one thing to grow better quality teak, it's another to negotiate a good price for your trees when you have little understanding of the market and what might increase value.

Farmers usually sell their standing teak trees to a middleman who cuts and transports the timber before trading it on. The farmers can only bargain on the basis of what they were paid for the last tree sold or what they know their neighbours received.

"We developed a model to estimate the value of farmers' teak trees," explains Aulia Perdana, marketing specialist with the World Agroforestry Centre Indonesia. "Using an objective method for measuring and valuing standing teak trees can increase the sale price by up to 10%."

"We also looked into collective marketing, which increases economies of scale and can greatly reduce transaction costs. It makes it possible for farmers to trade with larger market players, in this case wood-processing industries or wholesalers."

Farmers were introduced to teak processors in Yogyakarta who export certified furniture, and were trained in what it takes to produce certified teak wood.

Another way to increase the benefits farmers receive from their teak is for them to become involved in adding value by processing their trees into timber. A policy brief was prepared in 2010 and used in discussions with the government of Gunungkidul regarding how policy can be strengthened to foster such industries and support smallholder silviculture, micro-financing and marketing. The district

government has already taken steps to improve smallholder farmers' access to quality germplasm and silvicultural technical support.

The third obstacle the project sought to address is farmers' limited access to capital, which is often what leads them to sell their trees before they reach premium size.

"We sell our teak mainly if we need urgent cash for school expenses and daily needs," says Sayadi, a farmer from the village of Katongan. "My daughter is progressing in her schooling, she needs a lot of money. We have to sell our teak to cover her expenses."

Teak trees of 20–30 centimetres in diameter fetch about Rp 80,000 (A\$9). But if the tree is maintained until it reaches more than 30–40 cm, the value could increase to around Rp 450,000 (A\$50).

"If farmers had better access to micro-credit they wouldn't have to prematurely harvest their teak trees," Mr Perdana says. "Formal banks are reluctant to provide credit to farmers because they view teak growing as too risky or long-term, or because the farmers do not have the collateral to guarantee a loan."

The project team worked with nine farmer groups to establish the Lembaga Kredit Mikro (LKM) Gunung Seribu micro-finance institution. In the past two years it has provided loans to 300 households to help improve timber plantations.

Mr Roshetko believes this project, which operated for four years in the district, has seen significant improvements in smallholder teak production.

"Teak growers in Gunungkidul are equipped with the know-how to grow higher-quality trees, they have a better understanding about marketing, and a model micro-finance scheme has been established," Mr Roshetko says. "The district government has also been made aware

of how it can do its part to support farmers." Recommendations have also been made to the central government on simplifying regulations, such as those related to trading and transporting teak.

"If the economic benefits of growing teak in Indonesia can be maximised then it will become an even more attractive business prospect for smallholders," Mr Roshetko says. "And this would lead to more productive land, better quality teak wood being produced and wealthier farmers."

ACIAR's Forestry Research Program manager Tony Bartlett says: "This project has provided good practical scientific results on both teak growing and enhanced returns for farmers. When coupled with other ACIAR research on improving value-added processing by furniture makers in Java, it will lead to enhanced livelihoods and more sustainably produced wooden furniture being sold on international markets."

The ACIAR-funded project, 'Improving economic outcomes for smallholders growing teak in agroforestry systems in Indonesia', was a partnership between the World Agroforestry Centre, the Center for International Forestry Research, the Forestry Research and Development Agency of the Government of Indonesia, Institut Pertanian Bogor, the Australian National University and Kelompok Kerja Hutan Rakyat Lestari, Kabupaten Gunung Kidul. ■

PARTNER COUNTRY INDONESIA

PROJECT: LFST/2005/177 – Improving economic outcomes for smallholders growing teak in agroforestry systems in Indonesia
CONTACT: Dede Rohadi, d.rohadi@cgiar.org

Overseas aid a fair trade

Australia's competitive research funding model is helping developing countries deliver on mandates to improve agriculture with important rebound benefits.



Farmer Pa Heu (left) showing a sweetpotato patch being grown to feed pigs to Peter Horne (centre) and Khampai Phommavong.



KEY POINTS:

- **Adoption in Asia of competitive research-funding models and collaborative R&D strategies is being promoted by ACIAR.**
- **The program is building capacity to better service local agricultural issues in ways that benefit farmers and develop improved technologies, management systems and knowledge.**
- **As a result, former recipients of this capacity building have become donors to poorer neighbours.**

BY MELISSA BRANAGH-McCONACHY

The competitive nature of science in developed countries is recognised as a driver of progressive research.

Now through ACIAR, Australia is helping partner countries in South-East Asia benefit from competitive research-funding methodologies and, in the process, enhancing research management.

As the major player implementing competitive funding environments in Indonesia and Cambodia, ACIAR is helping agricultural researchers there to address technology, systems and market issues and to improve on-farm productivity and profitability.

COMPETITIVE RESEARCH DRIVES REFORM IN INDONESIA

ACIAR has been supporting the development of competitive research funding mechanisms with the Indonesian Center for Agricultural Technology Assessment and Development (ICATAD). ICATAD oversees a network of province-based Institutes for Assessment of Agricultural Technologies, known as BPTPs. The BPTPs have the role of assessing the suitability of new agricultural technologies and methodologies for each province. The managers of ICATAD were seeking ways to improve the relevance of the research conducted by BPTPs for the provinces where they are located. Working with ACIAR, they identified several aspects of the way research funds were allocated that held back the relevance of the research. Funds were typically only allocated for a single calendar year even though agricultural production cycles cut across calendar years. There were few incentives to work in teams or with other province-based R&D agencies.

Australia's competitive research-funding models roused the interest of senior managers from ICATAD. As recipients of ACIAR's John Dillon Memorial Fellowship, which helps build capacity for research management in partner countries, ICATAD former head Dr Muhrizal Sarwani and his deputy Dr Erizal Jamal were exposed to best-practice research, extension and policy-making initiatives in Australia.

"ICATAD managers were very committed to bringing about positive change in the way ICATAD managed research and we saw an opportunity to work with an enlightened leadership," says Dr Peter Horne, ACIAR's regional coordinator covering Indonesia. Dr Sarwani and Dr Jamal identified several innovations they wished to pilot with support from ACIAR. One of these was the development of a collaborative competitive research grants (CCRG) scheme, with funding support from AusAID under the Smallholder Agribusiness Development Initiative. The pilot program was designed to be of a scale that could be absorbed into the ICATAD system and consisted of:

- grants valued at up to US\$15,000 to be awarded on a competitive basis
- projects that could be trialled over multiple years, enabling studies to be conducted over several wet seasons, and
- mandatory collaboration with a provincial R&D agency, to ensure representation of regional interests.

UNPRECEDENTED RESEARCH DEVELOPMENTS

The CCRG system was piloted in four Indonesian provinces between 2007 and 2009. During the first year, 600 research proposals were submitted and evaluated and 200 awarded funding. As these grants could be over up to three years, it changed the way researchers were able to evaluate new agricultural technologies with farmers. Dr Horne pointed out that "because of the funding restrictions, new agricultural technologies or management systems were tested with just a few model farmers over a very short period of time, which was not a reliable assessment of their potential if disseminated more broadly. Through the CCRG program researchers have had the opportunity to conduct trials with 500 or more farmers over several seasons, encouraging them to innovate

and adapt technologies to their own conditions.”

Dr Horne says this kind of research could not be conducted without the CCRG changes. “The capacity building and institutional change effected by this sort of reform is fundamental,” he says.

“Collaborative competition will see the priorities of individual provinces addressed and we are hopeful it will result in agricultural technologies, management systems and knowledge that can be more successfully rolled out because they have been proven on-farm over several years—not just one.”

The CCRG model has since been rolled out nationwide, covering BPTPs in all 33 provinces and the majority of their research budgets.

One of the key challenges under the new competitive research environment is addressing the fallout for scientists who are unsuccessful in their funding application.

“There are about 3,000 researchers in provincial institutes throughout Indonesia and not all would receive funding under a CCRG system,” Dr Horne says. “We were concerned that rapid and whole-scale rollout could cause such problems, so we plan to continue support for the further refinement of the system.”

While the program is now using Indonesian research funding, ACIAR’s involvement will continue over several years. “The ACIAR model is about long-term partnership. Individual researchers come and go but institutional partnerships remain the foundation of our collaboration,” he says.

COMPETITIVE RESEARCH ADDRESSES STRATEGIC PRIORITIES IN CAMBODIA

In Cambodia, competitive research is centred on increasing the productivity of rice-based farming systems, agricultural diversification into non-rice field and horticultural crops and ruminant livestock, and developing capacity for more efficient use of soil and water resources. ACIAR’s principal regional coordinator for Mekong countries Dr Gamini Keerthisinghe says projects are predominantly helping smallholder farmers “move from subsistence to market production”.

The Cambodian Agricultural Research Fund (CARF), established in 2002 and co-funded by ACIAR and AusAID, continues to provide Cambodian scientists with opportunities to identify research priorities, design demand-driven agricultural research projects, compete for agricultural research funds and lead selected projects.

CARF projects will be integrated into larger programs under the Cambodia Agricultural Value Chain (CAVAC) initiative, a five-year undertaking launched in 2009 to accelerate

growth of agricultural production and smallholder incomes.

ACIAR is managing CAVAC’s research and extension component, which allocates funding to national and regional institutions using the competitive model.

Dr Keerthisinghe, says successful applicants are addressing priorities including food security and adaptation to climate change and variability.

“The Cambodian agriculture production environment is, in general, harsher than the fertile lowlands of the other countries in the region,” he says.

PARTNERSHIPS DELIVER MUTUAL BENEFITS

Agricultural research offers significant potential for food productivity improvements and economic growth across Indonesia—where 49% of the population lives on less than US\$2 per day and most are dependent on agriculture—and Cambodia, where about 80% of the population and most of the country’s poor rely on agriculture for their livelihoods. There are also significant mutual benefits from this research for Australia.

Research in Indonesia, for example, is addressing biosecurity concerns for both countries in horticulture and livestock systems. A project in the provinces of NTB and NTT is conducting research on agronomic practices and rhizobiology that can potentially benefit peanut, mungbean and soybean crops in both countries.

Dr Keerthisinghe says research partnerships established between Cambodia and Australia are improving rice germplasm, establishment and productivity in both countries. They are also strengthening tomato, chilli, sweet pepper and leafy vegetable industries through adoption of better production and postharvest practices.

ACIAR partnerships are helping to establish effective disease surveillance, control policies and systems to improve pest and disease management in both countries.

EDUCATION STRENGTHENS INTERNATIONAL COLLABORATION

While the collaborative research program emphasises partnerships, ACIAR also supports the longer-term delivery of research outcomes through individual capacity building and institutional development.

In-country training and international postgraduate studies supported by ACIAR have helped to equip Indonesian and Cambodian scientists for senior roles and to shape change in their respective countries.

ACIAR’s John Dillon Memorial Fellowship provides career development opportunities for up to six young scientists and economists

each year, who develop leadership skills in agricultural research management, policy and extension technologies through exposure to best-practice Australian organisations.

Dr Horne says many of the Fellows have gone on to occupy influential government positions in partner countries, fostering strong international relations.

“Our partnerships are key to promoting positive views of Australia overseas,” he says. “As we work with partner countries over a long period of time, networks develop that have many unintended benefits and consequences.”

“Our partnerships are key to promoting positive views of Australia overseas. As we work with partner countries over a long period of time, networks develop that have many unintended benefits and consequences.”

– PETER HORNE

THIRD-COUNTRY CONTRACTS BROKER INTERNATIONAL AGREEMENT

For the first time, ACIAR has contracted a foreign university to manage a project in another region as part of a third-country deal expected to advance relations in South-East Asia.

Under an agreement between ACIAR and Mataram University in NTB province, Indonesian researchers are conducting a two-year program to improve management and productivity of Bali cattle in East Timor.

“We wanted to build a livestock research program in East Timor and the East Timorese were keen to develop linkages with Indonesia, so we recognised this was an opportunity to support the desire of both countries to strengthen their ties,” Dr Horne says. “With Australia as third-party broker, the project will create a stronger trilateral relationship.”

The two-year initiative effectively allows ACIAR’s partner research agencies to become project managers for the benefit of other countries. If successful, Dr Horne says there are several opportunities for cross-border research collaboration using the same model. ■

PARTNER COUNTRIES INDONESIA, CAMBODIA

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MUTUAL GAINS ON WATERLOGGED, SALINE SOILS

Australian and Indian researchers have united to tackle big environmental and agricultural threats head on.

KEY POINTS:

■ **Two Australian and three Indian pre-breeding teams are working to improve crop resilience to soil toxicities.**

■ **At stake is productivity on soils laced with sodium, boron, magnesium, bicarbonate, aluminium and iron toxicities.**

BY MELISSA BRANAGH-McCONACHY

The loss of farmland to waterlogging and salinity is a major threat to growers in Australia, while in India environmental stresses are compromising farmers' capacity to feed their families.

Dr Tim Setter, principal scientist with the Department of Agriculture and Food, Western Australia (DAFWA), says food security is a concern in India, where researchers are working with an average farm size of 1 hectare. Issues related to people and industry security are foremost in Australia, where the average farm size under investigation is 10,000 ha.

ACIAR is funding a joint project to enhance wheat improvement for both countries in the face of a changing climate where waterlogging, salinity and associated element toxicities currently limit production and are likely to worsen in the future.

Dr Setter is leading a project with five pre-breeding teams. Multidisciplinary teams of physiologists, soil scientists, pathologists, molecular geneticists and breeders from Australia's University of Adelaide, Murdoch University and DAFWA are working together with India's Directorate of Wheat Research, the Central Soil Salinity Research Institute and Narendra Deva University of Agriculture and Technology.

They are trialling Indian and Australian wheat varieties to identify and develop more resilient parental material for breeding programs.

In one of the activities under the project, Dr Setter is overseeing one of Australia's largest salinity experiments at Ballidu, north-east of Perth. Salinity affects about 2.5 million hectares of agricultural land in Australia and costs an estimated A\$1.5 billion each year in lost agricultural production.

"Soils in salt-affected areas are variable and affected by factors other than salinity," Dr Setter says. "Therefore if we can increase production on salt-affected soils by selecting the correct varieties, we have the potential to do something important for growers in India and Australia.

"But this is not easy because salinity is a complex stress, which is why decades have passed with little or no progress in varietal improvement for salt-affected soils."

Researchers in this project have identified at least nine different types of salt-affected soils. On top of this there are two types of salinity: transient salinity, which occurs when salts in the subsoil concentrate as the soil changes with season and rainfall; and dryland salinity, due to rising watertables bringing salts to the soil surface.

"In dry years Australian growers may leave saline paddocks fallow," Dr Setter says. "But Indian farmers don't have that luxury; they have to feed their family, so there are very different priorities at play. This has created a testing ground for the most tolerant grain varieties we have."

TOLERANCE OFFERS OPPORTUNITIES FOR IMPROVED WHEATS

ACIAR support is enabling researchers to focus on win-win opportunities that relate not only to salinity but to other complex abiotic stresses.

Dr Setter says tolerance to element toxicities and deficiencies offers great opportunities for wheat improvement under a range of complex stresses including waterlogging, salinity and drought.

In Australia and India, alkaline soils are often affected by sodium, boron, magnesium and bicarbonate toxicities, while acidic soils are often affected by aluminium and iron toxicities.

As greater tolerance to these background elements is likely to have major production

impacts, extension of the current work to multi-location trials is a top priority for growers and scientists.

"We are only at the beginning of this field-based research," Dr Setter says. "But by conducting research in the field and characterising target field environments we have advanced the potential for varietal improvement by decades.

"As the expression goes: 'It doesn't matter how fast you run if you're on the wrong road.' Doing the science in the field is therefore an important part of this research."

Project researchers are now developing molecular marker technology to assist selection of germplasm with improved salt, waterlogging and micro-element tolerance and productivity.

Dr Setter anticipates that elite germplasm combining India's best salt-tolerant lines with highly productive drought and salt-tolerant Australian varieties will be available for breeders when the current project ends in 2012.

The germplasm will be used as parental material to develop new varieties for both Australia and India. ■

PARTNER COUNTRY INDIA

PROJECT: CIM2006/177 – Wheat improvement for waterlogging, salinity and element toxicities in Australia and India

CONTACT: Dr Tim Setter, +61 8 9368 3289, tsetter@agric.wa.gov.au

Dr Tim Setter (centre) with DAFWA research officer Irene Waters and technical officer Rod Bowey at the Katanning waterlogging research site.



PHOTO: EVAN COLLIS

Understanding the social dynamics present in developing country contexts can help address gender issues and create opportunities for women to start small businesses.



INNOVATION REAPS FOOD SECURITY REWARDS

Smallholder farmers face a range of challenges in adopting new practices developed through agricultural research. An understanding of the socioeconomic and human factors constraining adoption can help in this transition.

KEY POINTS:

- **Research for development can deliver improved practices, with the likelihood of adoption improving through projects that understand farmer contexts.**
- **Socioeconomic, cultural, social and biophysical constraints can all affect farmers within a system in a variety of ways.**
- **Participatory action research is an important component of adoption of practices.**

BY WARREN PAGE

Justiniano Celeres farms his half-hectare plot of land on the mountainous slopes of Pilar, on the island of Bohol, in the Philippines. Five years ago the sole crop planted was cassava. Justiniano's main challenge was managing the topsoils that were frequently washed away in heavy rains.

Today he plants cassava, pineapples, ginger, corn and sweetpotato. The increased yields and variety of crops provide a year-round income: Justiniano can feed his wife and six children and still have money available. Five years ago any income was dependent on the successful harvesting of the cassava crop.

In Papua New Guinea the Women in Agriculture association helps women negotiate the constraints to entering new markets. In many cases these constraints are not limited to logistical questions of accessing markets, but extend to microfinance to support new enterprises, bookkeeping and market information.

A workshop of approximately 60 women from Morobe, Highlands and Central provinces was held in March 2010 to define what led to successes, and what did not, in training programs on horticulture for women smallholders. The outputs, including the successes in training, are now shaping training approaches and new research initiatives targeting women farmers.

The thread that ties these people together—their involvement in ACIAR-funded projects—extends to many other countries and systems. These two projects have changed lives by understanding the factors affecting innovation and designing responses to those factors.

Incentive structures, traditions, social capital and beliefs and values all affect a farmer's individual decision making (see Figure 1).

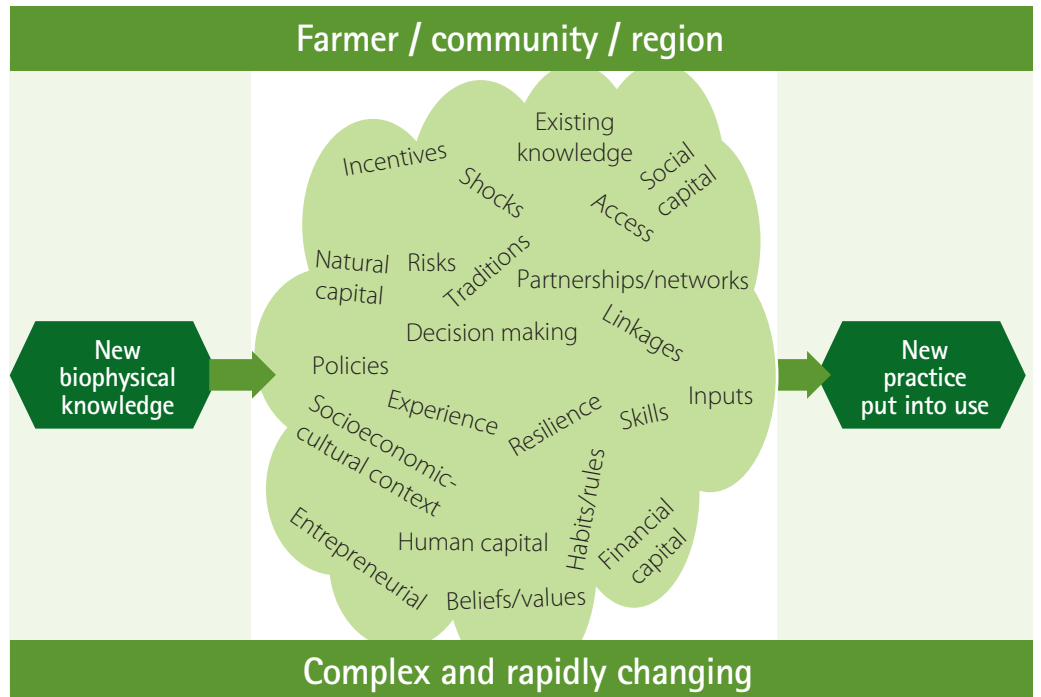
For Justiniano, a key decision point to become involved in an ACIAR project on developing and adapting landcare techniques in the Philippines was seeing so much of the topsoil, vital to the viability of his farm, continue to disappear.

"You could hardly see any topsoil at all here before I started landcare," Justiniano says. By following the landcare approach of ploughing contours and creating natural vegetative strips along the steep slopes of his farm, Justiniano was able to see changes within a year.

"Now the topsoil has built up again. The soil is healthy now and I don't have to use as many fertilisers or chemicals, so my costs are less."

The benefit to the farm soon followed, with several crops providing a year-round income. It also provides Justiniano with the ability to

Figure 1 Incentive structures, traditions, social capital and beliefs and values all affect a farmer's individual decision making



better plan for the future, and tie his plans to the income potential of the farm.

"While one crop is at a young stage, I am

planting another crop and harvesting yet another," he says.

In the same way that noticing changes



prompted Justiniano to act, so too are the changes on his farm becoming visible to others. Farmers in the locality of his farm have noticed Justiniano's success and are copying landcare practices on their own farms.

ACIAR projects operate across systems and scales, from the farm throughout the supply chain, and at the regional and national levels, so an understanding of the social, cultural and economic context is critical to achieving maximum impact from new agricultural practices.

With each scale there will be associated policies, institutions and processes that operate, each having an impact on the constraints to adoption and the most appropriate responses.

At the heart of each project is the capacity to innovate and the effects on:

- skills—scientific, entrepreneurial and managerial
- patterns of interaction—partnerships, alliances and networks
- working ways—routines, organisational culture and traditional practices
- policies—type and implementation, and
- learning—ability to continuously learn how to use knowledge.

For Justiniano the journey from struggle to opportunity continues, each new year offering greater hope. In PNG the Women in Agriculture group is closer to the beginning. ACIAR is using the results of the workshop to design a new research initiative, aimed at developing the business acumen of the WiA membership.

In many cases ACIAR projects aim to help marginalised groups. Gender issues, particularly the distribution of roles in households and the dynamics of decision-making, are important. Helping women in PNG develop the business acumen needed to support adoption is important.

One of the successes of past ACIAR social research was reported in the December 2004 edition of *Partners*—the development of a mobile card scheme allowing harvesting of loose oil palm fruit. The card particularly empowered women by paying them directly into their bank accounts for any fruits harvested. This income, previously paid to their husbands, was quarantined by the women card holders and used for food, education for children and other family needs.

The scheme worked because it was designed specifically around issues of gender, socioeconomic constraints such as land ownership and credit to create a new approach.

Enhancing farmer opportunities to improve livelihoods helps create the means of moving out of poverty. This can include helping farmers engage in the cash economy, or help increase their capabilities and create assets, and build resilience. Improved livelihoods give farmers flexibility, so they can better plan for and manage risk, and take advantage of market-oriented opportunities.

Understanding and improving on the incentives for smallholders to innovate can change lives. The constraints on adoption can also be drivers of change. In the case of Justiniano the incentive was the desire to stop the topsoil on his arm from eroding away. For the PNG Women in Agriculture group it was the opportunity of a workshop. Both are linked to the common dream of finding a better life, free from poverty. ■



BENEFITS TO AUSTRALIA: FARMER CASE STUDY

Developed during ACIAR projects in South Africa, Beef Profit Partnerships proved so successful it has since been adopted in Australia and New Zealand.

KEY POINTS:

- A network of Beef Profit Partnership (BPP) teams is being established across Australia, comprising industry members, farmers and researchers.
- BPPs tightly link on-farm and supply-chain innovation with improved profitability of beef businesses and outcomes discernible from the outset.

BY CATHERINE NORWOOD

Murray and Debbie Haigh own and operate Redfield Pastoral at Washpool in Central Queensland (CQ). Their 19,153-hectare property is devoted to breeding and fattening a mixed Droughtmaster, Brahman and Charolais cattle herd.

With management practices fine-tuned through the Beef Profit Partnership (BPP) program, Murray says he has been able to steadily increase the value of his animals. "I have a benchmark price and I don't like to sell stock below that price," he says. "Over the past five years our average price per beast has risen from \$795 to \$863."

Murray has been a member of the CQ BEEF Mackenzie River BPP group since 2006. The group has six members, all of whom live within 100 kilometres of each other. He joined the group out of interest in the Profit Probe™ software tool, which is provided as part of the program. He says the software provides analysis that helps to concentrate his focus where it will have the most financial impact for his business.

He was first introduced to Profit Probe™ as part of a Grazing for Profit course. While aware that the program originated with an aid initiative in Africa, he has found it valuable for his own business, particularly now that it has been developed as an online program.

Using these tools he quickly discovered that he could achieve greater profits by buying in and fattening his own steers, rather than leasing part of his property to others, who were doing the same thing. "Agistment only gave us about \$2.50 per head per week," he says. "Running our own cattle gave us a return of \$4–\$5/head/week."

It also helped identify the benefits of breeding their own cattle and of increasing throughput by mating heifers early. They now mate their heifers at 12 months of age, rather than waiting up to two years, and use supplements to help the heifers gain the weight needed for successful

Murray Haigh is using techniques pioneered in an ACIAR project on his central Queensland property to maximise profits from his cattle breeding and fattening operation.



PHOTO: DEBBIE HAIGH

mating. The heifer calving percentage has increased from 60% to about 76%.

Financial analysis indicated they needed to increase calving by 12% to cover the cost of the supplements. They not only exceeded this benchmark but have earned extra income from heavier cows when it comes time to sell.

Discussion with the members of his BPP group has encouraged Murray to take an even more rigorous approach to mating. He now weighs heifers in advance and those with no chance of reaching the 300-kilogram benchmark are culled. He grazes these heifers for six months or so on marginal land, which may not otherwise be used, before selling them.

"The group discussions have been a valuable part of the program, although it was a bit daunting initially, exposing my finances and business practices to other people," he says. "But it is a good opportunity to hear what other people are doing and to throw ideas around. You can fudge the figures to make yourself look better, but in the end, you're only kidding yourself."

He sells his cattle directly to the meatworks—mainly the Japanese ox market—but a key part of his strategy is to sell them when it suits him, not when he is forced to ... a ploy also adopted by beef farmers in South African BPPs.

"We stock about one beast per 10 acres," he says. "If we pushed the land we could increase that to one per 8 acres. But I don't want to be

put into a position where I'm forced to sell because there's an interest payment due, or because of the seasonal conditions."

Reducing the level of debt and diversifying risk is his current focus so that he is better able to ride production ups and downs. He is also investigating other farming opportunities, including cropping, but so far the numbers have not stacked up.

Across the BPP program in Queensland, 25 teams made up of 250 beef businesses and 600 partners have assessed more than 275 improvement options. More than 120 innovations have been implemented, each with measurable impacts on productivity and profitability at individual beef business level.

Preliminary analysis by the University of New England has found that profits for 60% of 58 businesses studied were beating the comparable regional industry average by more than 5%, while 25% beat it by more than 20%. ■

PARTNER COUNTRY SOUTH AFRICA

PROJECT: LPS/1999/036 – Developing profitable beef business systems for previously disadvantaged farmers in South Africa.

CONTACT: Beef Cooperative Research Centre, www.beefcrc.com.au/BeefProfitPartnerships

Work for world's poor improves Australia's crop fortunes

Australia's long-standing partnership with the CGIAR's agricultural research centres, aimed at alleviating poverty in the developing world, has also reaped many benefits on home soil.

KEY POINTS:

- **Australia's agricultural industries benefit from ACIAR's investment in CGIAR centres around the world.**
- **Important gains have been made thanks to access to international germplasm, optimising breeding potential for traits desirable for Australian conditions.**
- **Benefits have also derived from participation in an international research community collaborating on issues relevant to the region.**
- **Careful breeding has allowed Australia to return benefits to the international community.**

BY MELISSA MARINO

For a country devoid of any indigenous broadacre agricultural crops, and which imports all its base germplasm, the importance of Australia's partnership with the Consultative Group on International Agricultural Research (CGIAR) cannot be underestimated.

The CGIAR facilitates scientific research between the world's best agricultural minds to improve food production in developing countries. But in the process of alleviating famine and poverty through work with smallholder farmers, the CGIAR produces scientific advances, genetic resources and relationships of value to Australia.

Benefits of ACIAR's \$18 million annual investment in the CGIAR are evidenced through the knowledge gained from participation in an international research community operating for public good. This is most obvious in crop production: Australian breeders gain access to genetic material from all over the world that contains the diversity needed to build up the yield potential, quality and resilience of local varieties.

This includes the high-yielding semi-dwarf varieties from Mexico that transformed Australian wheat production in the 1970s, to the latest genetic defences being built into wheat to protect against modern-day disease threats such as the highly virulent rust strain, Ug99.

THE INTERNATIONAL FLAVOUR OF AUSTRALIAN WHEAT

The effort to advance Australian-grown wheat with new international genetic material dates back to the late 1800s, when William Farrer bred his breakthrough variety, Federation, from germplasm sourced from India, Italy and Canada. This greatly improved the prospects for Australia's farmers, who had struggled to grow British and northern European varieties in Australia's hotter, drier climate.

Released in 1901, 'the great wheat' Federation trebled Australia's wheat harvest in 20 years. It was bred from crossing Purple Straw (now thought to have originated in Italy), Canadian Fife wheats and the Indian wheat Etawah.

A century later and ACIAR's Crop Improvement and Management research program manager Dr Paul Fox says much of the stress tolerance in varieties grown today can be traced back to Farrer's Indian wheats.

The next big wave of improvement through international germplasm occurred in the 1960s when the CGIAR was established and the Green Revolution was getting underway. At that time, Australia began looking further afield to Mexico and the Middle East for genetic material, culminating in an influx of germplasm from what would become a key CGIAR centre—the International Maize and Wheat Improvement Center (CIMMYT) in Mexico.

Wheat genealogy expert and University of Adelaide researcher Dr Howard Eagles says the shorter, stronger, rust-resistant and high-yielding CIMMYT semi-dwarf varieties were cross-bred with existing Australian wheat varieties. This allowed for the new traits to be incorporated without diluting the quality traits already established in Australian varieties required for domestic and export markets.

Dr Eagles says it is Dr Albert Pugsley who Australia can thank most for introducing semi-dwarf varieties and their benefits. Based at Farrer's former workplace, the Wagga Wagga Agricultural Institute, Dr Pugsley worked with

the emerging international wheat-breeding community—including Nobel Prize winner Norman Borlaug from CIMMYT—to source the CIMMYT germplasm.

Today, that germplasm is the platform on which Australia's wheat industry is largely built—with Australia's key quality traits bred back into it.

The extent of CIMMYT's impact on the Australian wheat industry is illustrated in a 2004 analysis by John Brennan and Kathryn Quade. It found that 193 varieties incorporating CIMMYT genetic material had been released in Australia by the end of 2003. By 2001, these varieties covered 98% of the area sown to wheat in Australia.

Yield gains attributable directly to CIMMYT averaged 4.6% across Australia in 2001, with gains as high as 10.5% in Queensland, more than 7% in Victoria and New South Wales, and about 2% in South Australia and Western Australia.

In terms of world wheat production, yields were estimated to be 12% higher because of CIMMYT's research, and world prices 7.4% lower than if CIMMYT had not achieved those improvements.

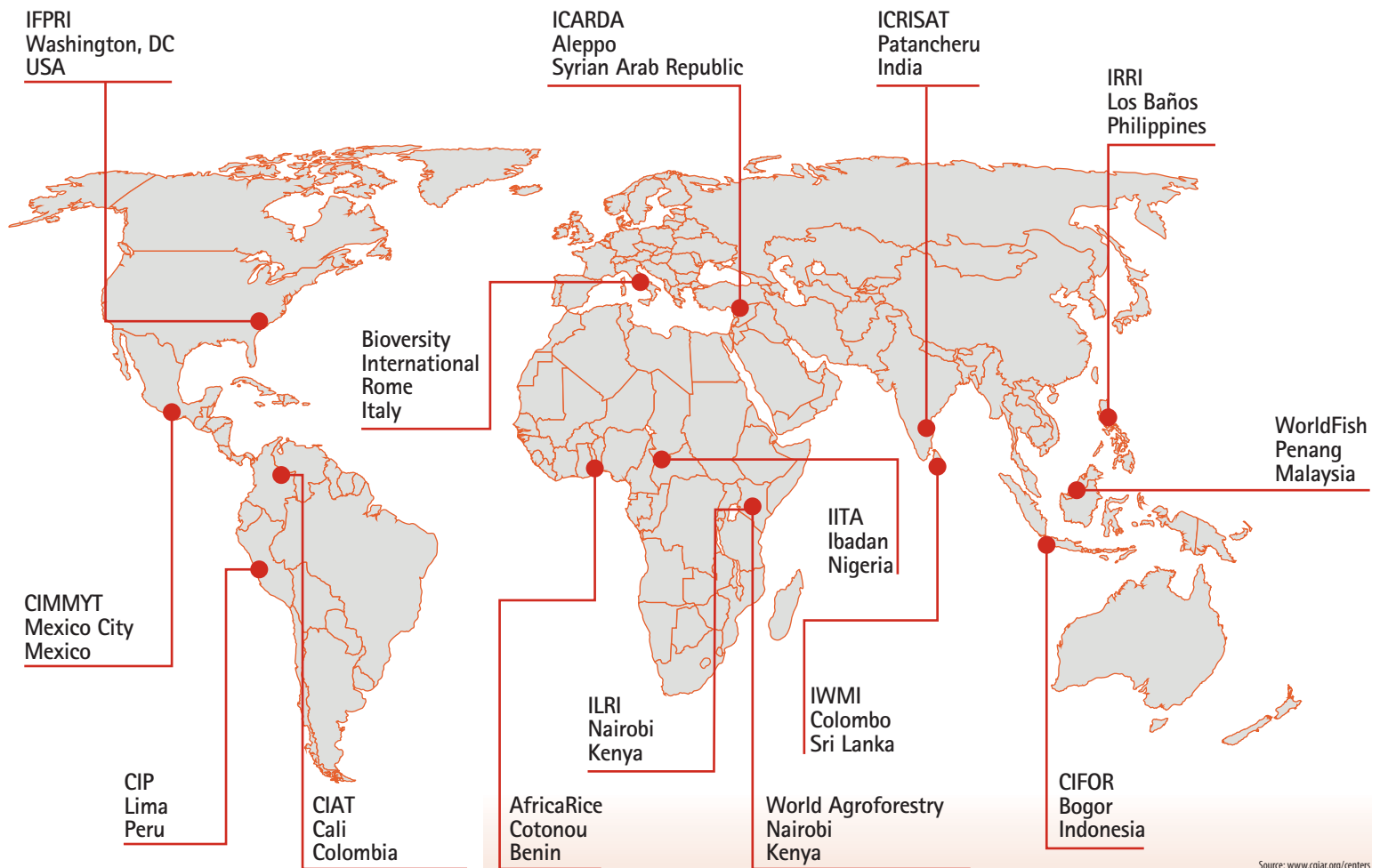
THE CGIAR AS CONDUIT OF GLOBAL CROP BIODIVERSITY

International exchange of germplasm was taking place well before the CGIAR was formed in 1971 as an umbrella organisation for international research centres such as CIMMYT. But Dr Fox and Dr Eagles are in no doubt that germplasm transfer to this day is helped through Australia's investment in the group.

Dr Fox says the steady, long-term working relationship Australia shares with CIMMYT and other CGIAR centres has assured the smooth flow of germplasm into Australia. While not the biggest donor to the CGIAR, Australia has been consistent and reliable and, in turn, centres have been forthcoming in sending germplasm here.

Key benefits from the relationship are

Figure 1 The centres of the Consultative Group on International Agricultural Research (CGIAR)

Source: www.cgiar.org/centers

pointedly illustrated today through the global fight against Ug99, the costly stem rust disease of wheat. New defences are being built into wheat through cross-breeding varieties from around the world, facilitated by CGIAR-affiliated research centres, in particular at CIMMYT under the guidance of University of Sydney graduate Dr Ravi Singh.

And it's not just from CIMMYT that Australia has seen benefits.

A 2002 report on the impact on Australian agriculture from the CGIAR-affiliated International Center for Agricultural Research in the Dry Areas (ICARDA) in Syria found a large amount of its material used in Australian breeding programs.

It found a regular exchange of both germplasm and personnel between Australia and ICARDA and that, in particular, the Australian faba bean and lentil industries have relied heavily on ICARDA germplasm. Resistance to the devastating chickpea disease ascochyta blight was obtained through the ICARDA program, as was improved drought tolerance for barley. Durum wheat genetic material was also expected to result in improved varieties.

CGIAR overview

The Consultative Group on International Agricultural Research (CGIAR) supports 15 international agricultural and sustainable development research centres across Asia, Africa, North and South America and the Middle East.

It works in collaboration with many hundreds of government and civil society organisations as well as private businesses around the world, including ACIAR in Australia.

Guided by a vision of reduced poverty and hunger, improved health and nutrition and greater ecosystem resilience, the CGIAR applies science to foster sustainable agricultural growth that benefits the poor.

New crop varieties, knowledge and other products resulting from the CGIAR's collaborative research are made widely available to those working for sustainable agricultural development throughout the world.

Eleven CGIAR centres maintain international gene banks. These preserve and make readily available a wide array of plant genetic resources, which form the basis of global food security. The CGIAR also implements CGIAR Research Programs, designed to address important

global or regional issues such as micronutrient deficiencies, water scarcity and climate change through broad-based research partnerships.

Without public investment in international agricultural research through the CGIAR an independent 2008 review estimated:

- world food production would be 4–5% lower
- developing countries would produce 7–8% less food
- world food and feed grain prices would be 18–21% higher, and
- 13–15 million more children would be malnourished.

The average annual economic benefits from CGIAR research has been estimated at US\$2.5 billion for wheat, US\$10.8 billion for rice in Asia and up to US\$0.8 billion for maize.

Crop development in which CGIAR research has been instrumental includes drought-tolerant maize for Africa, flood-tolerant rice for Asia, New Rices for Africa (NERICA) and biofortified crops, such as improved sweetpotato varieties, bred to be rich in nutrients to reduce malnutrition, including vitamin A deficiency.



Dr Howard Eagles

PHOTO: EMMA LEONARD



Dr Paul Fox

PHOTO: EMMA LEONARD

The legacy of Federation

When it comes to wheat, it is well documented that the average annual economic benefit from CGIAR research stretches into billions of dollars. Less known is the historic role that Australian genetic material played in the development of such crops. It is a trail that can be traced back to the 1800s and the creation by William Farrer of Australia's "great wheat", Federation.

Federation transformed the fortunes of Australia's wheat growers at the turn of the 20th century and today its legacy lives on.

Wheat genealogy expert Dr Howard Eagles from the University of Adelaide says the foundation of CIMMYT semi-dwarf varieties, which formed the basis of so many modern varieties, was created with the help of wheat sourced from Australia via two routes.

First, CIMMYT breeders working under Nobel laureate Norman Borlaug used Australian wheats "quite substantially" in their crossing programs during the 1950s and 1960s for their quality and disease-resistance traits, leading up to the creation of semi-dwarf wheats, he says.

But by poring over North American wheat pedigrees, Dr Eagles has found a new twist. Some CIMMYT germplasm has an even older connection to Australia, with markers in it that can be traced back to Farrer's Federation.

"Through another strand, CIMMYT breeders used a North American wheat called Brevor and we have now shown that Brevor in fact contains genes out of Federation," he says.

This occurred because Federation was exported to the United States in the early 1900s, where it was grown extensively in the north-west and bred into Brevor, which in turn was used by CIMMYT breeders.

"So we are finding we are getting some of our old genes back through the CIMMYT program," Dr Eagles says. "It's a part of the Federation story that people don't know about."

The average net gain to Australia as a result of the overall ICARDA research effort was estimated at \$13.7 million annually to 2022, with most gains seen in faba bean and lentil industries. The report also found benefits from collaborative arrangements including screening for pest and disease resistances, training and the availability of reports and evaluations.

Similarly, an analysis of the benefit from ACIAR's relationship with the Indian-based International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) found Australian breeding programs had utilised a large amount of ICRISAT material. Overall, the net gain to Australia of the research effort was estimated to average \$1.52 million a year.

Australia's relationship with the CGIAR centres has also led to genetic benefits in rice, such as cold-tolerance traits sourced from the Philippines-based International Rice Research Institute (IRRI), Dr Fox says. Various reports also found that productivity gains from a number of crops bred with international germplasm have more than offset lower prices caused by yield increases.

MUTUAL BENEFITS CONSOLIDATE INTO LONG-TERM RELATIONSHIPS

Ultimately, developing countries benefit from Australia's participation in international efforts to use biodiversity to safeguard food security—and not just through the obvious benefits of financial support. Relationships are forged, trust built and new ways found to benefit from collaborations. This was remarkably demonstrated when Australia found itself in a position to donate Indian germplasm back to India, where the old landraces had been lost due to enthusiastic uptake of modern CIMMYT germplasm.

"The Mexican wave in India became more like the Mexican tsunami and blew away many of the tolerance genes found in the old tall wheats," Dr Fox says. "But we can repatriate some of these genes for tolerance to soil stresses in good high-yielding modern varieties, sending germplasm back to India where the traits originally came from more than 100 years ago."

This flow and reverse-flow of genetic material is fostered by the collaborative research environment of the CGIAR system, in which Australians have been associated from the beginning.

It's a relationship that continues today through ACIAR's investment and through Australian researchers working with international colleagues in key centres including CIMMYT, ICARDA and IRRI.

"I think in general the CGIAR has been pretty important in fostering these global communities," Dr Fox says. "And I think the next phase is to push it a bit further to exchange information more efficiently and just to target it better."

ACIAR's Impact Assessment research program manager Dr Debbie Templeton says precise benefits to Australia from its investment are difficult to measure. But even the most conservative of assumptions could put the return to Australia at just over 4:1, she says.

A 2010 benefit-cost analysis by Anthea McClintock and Garry Griffith examining the effectiveness of CGIAR investment in ACIAR's mandated regions estimated that even under the most conservative assumptions, for every \$1 million invested a return of \$3.9 million was delivered to developing countries in those regions.

It found that ACIAR's investment in the CGIAR centres supports the group's core activities and provides specific project funding to individual centres consistent with ACIAR's country program strategies. ■

PARTNER ORGANISATION
CONSULTATIVE GROUP ON
INTERNATIONAL AGRICULTURAL
RESEARCH (CGIAR), www.cgiar.org
PROJECT: Suite of crop improvement,
bioinformatics, and genetic resource
conservation projects
CONTACT: Paul Fox, paul.fox@aciarc.gov.au

PHOTO: CATHERINE NORWOOD

The second Green Revolution

The way the world is expected to look in 2050 preys on the mind of Dr Thomas Lumpkin as the CIMMYT Director General oversees efforts to raise farm productivity and sustainability in the face of daunting challenges.



CIMMYT field staff harvest wheat from breeding improvement trials at El Batán, Mexico.

KEY POINTS:

- After years of stagnating investment in agricultural R&D, CIMMYT's budget has nearly doubled in the past three years.
- Agronomy and socioeconomic programs are being strengthened to support smallholder farmers in adopting improved farming systems.
- New donors and new research hubs support better linkages for the world's agricultural scientists and farmers.
- Benefits to Australian wheat growers from linkages with CIMMYT are estimated at \$150 million a year from improved varieties alone.

BY GIO BRAIDOTTI

The International Maize and Wheat Improvement Center (CIMMYT) is the CGIAR centre most closely associated with the Green Revolution. For close to 50 years it has used agricultural science to avert famine and champion human dignity.

While that association is a proud one, its Director General, Dr Thomas Lumpkin, believes new strategic goals are needed given the unprecedented intensity of the stresses bearing down on farmers. He cites peak population, climate-change-related production losses (especially from heat stress and disease), oversubscribed groundwater resources, peak oil, rising transport and production costs, and the need for 60% more wheat at affordable prices by 2050.

"We need to be bolder in our ambition and go far beyond promoting food security," Dr Lumpkin says. "We need to get so productive with agriculture that land currently under the plough can be returned to nature. This includes highly erodible lands, areas of high natural biodiversity and regions where water is running out."

He adds that a lot of people on marginal land do not want to live hand-to-mouth, watching their children die in front of them in impoverished villages. "We need to bring sustainable productivity to the whole world

to reduce the misery, the impacts of climate change and the footprint of agriculture on the environment."

To underpin food production within greater environmental and socioeconomic sustainability, Dr Lumpkin's goals move far beyond current productivity goals.

"Every day at CIMMYT we think about 2050—about the conditions we will be facing then," he says. "It takes scientists 15 to 20 years to get innovations into farmers' fields. So we must use foresight now to prepare for a very challenging future."

CIMMYT is looking to breeding and agronomy to make the gains needed but has also added a socioeconomic program to help smallholder farmers implement new approaches to land. This includes mobile-phone-based risk insurance packages, which Syngenta introduced to poor farmers in Kenya and which CIMMYT wants to extend to South Asia.

On the breeding front, CIMMYT is especially targeting water productivity and resilience to

PHOTO: BRAD COLLIS

PHOTO: CATHERINE NORWOOD



Dr Thomas Lumpkin

Glasshouses at CIMMYT in Mexico—the source of most of the germplasm in modern Australian wheat varieties.



"With ACIAR, however, it is not just about funding as we are also getting a lot of creative stimulation from Australia. The synergy with ACIAR is one of the best we have."

— DR THOMAS LUMPKIN, CIMMYT DIRECTOR-GENERAL

climate change—areas of concern to Australia, which already possesses important expertise among scientists and farmers alike.

Overall, CIMMYT wants to double wheat yields by 2050 without increasing inputs, especially irrigation water and fertiliser. Project partners include Australian scientists such as CSIRO's Dr Richard Richards, Dr Bob Furbank and Dr Tony Condon, who are taking important roles in the recently established Wheat Yield Potential Consortium.

While breeding is expected to contribute about half the gains needed in productivity and sustainability, the remainder is being sought from agronomy. CIMMYT has had to rebuild its agronomy program, previously a victim of budget cuts in the 1990s and 2000s.

"The breeding programs were maintained with lower costs and limped along during the downsizing," Dr Lumpkin says. "But CIMMYT's agronomy program completely disappeared. We have since been able to rebuild that around more productive and sustainable farming technologies—the kind that are prevalent in Australia, like precision agriculture and zero-tillage techniques."

The focus of the agronomy program is the adaptation of these conservation agriculture techniques for the developing world, a process that often involves working hand-in-hand with ACIAR.

Australia is considered an important ally on several other fronts. There is the financial

support administered through ACIAR, especially welcome during the global financial crisis when Australia's economic resilience contrasted with the budget woes of many other donor nations.

Dr Lumpkin says Australian scientists also accord well with CIMMYT activities, either as partners or employees, while Australian pre-breeders are a source of important genetic material especially when it comes to stress tolerance.

"A relatively limited amount of Australian germplasm makes its way to CIMMYT, but it tends to be of great value and quality and we are grateful for the contribution," Dr Lumpkin says. "We are making a considerable investment in drought-resistant, water-use-efficient, heat-tolerant wheat where we work closely with Australia."

The flow of germplasm from CIMMYT to Australia is far greater, with studies estimating that in excess of 90% of the wheat grown in Australia is descended from material in CIMMYT's gene bank. The net worth to Australia of these genetic resources is nearly \$150 million a year.

Work also continues on the perennial problem posed by wheat diseases, with Dr Lumpkin especially concerned by the Ug99 stem rust strain and a fungal disease—blast—that is devastating wheat crops in South America. To date CIMMYT has detected little genetic resistance in wheat to blast and no effective fungicides.

Balancing this out is renewed interest in

CIMMYT's work from investors, both public and private, including from non-traditional sources. Mexico is now CIMMYT's biggest donor, India is providing 500 hectares of land and funds to create the Borlaug Institute for South Asia, and the Bill & Melinda Gates Foundation is supporting important initiatives in sub-Saharan Africa.

A flagship CIMMYT initiative is SIMLESA (Sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa). Funded by ACIAR and launched in 2010, the four-year program aims to increase household and regional food security, incomes and economic development through innovation across the supply chain.

"We are seeing the new world order begin to emerge and with it, a doubling of our budget in the past three years," Dr Lumpkin says. "All along ACIAR has been a committed partner to CIMMYT's activities. With ACIAR, however, it is not just about funding as we are also getting a lot of creative stimulation from Australia. The synergy with ACIAR is one of the best we have." ■

PARTNER ORGANISATION
INTERNATIONAL MAIZE AND WHEAT
IMPROVEMENT CENTER (CIMMYT)

www.cimmyt.org

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INDIGENOUS KNOWLEDGE SHARING

ACIAR recently hosted a forum looking at ways of increasing knowledge transfer between indigenous communities world-wide.

KEY POINTS:

- There are parallels to the development needs, opportunities and obstacles of Indigenous Australians and smallholders in developing countries.
- ACIAR is extending to Indigenous Australians the experience gained improving livelihoods and developing business opportunities in the Asia-Pacific region.
- An aquaculture-based industry development project is demonstrating the value of knowledge-transfer between Indigenous communities across the world.

BY HOLLY REID

At a glance, the indigenous communities of Australia and the Asia-Pacific region might not seem to have much in common. Cultural aspects such as language, customs and rituals are unique not only to each community, but different mobs within these regions.

Yet on closer inspection, the development needs, opportunities and obstacles of Indigenous Australians are, in some cases, parallel to those of smallholders in Tonga, Fiji, Kiribati, Samoa, the Philippines, and even to groups as far away as northern Africa.

It is this alignment that underpins the ACIAR project 'Developing aquaculture-based livelihoods in the Pacific islands region and tropical Australia', a venture demonstrating the value of knowledge-transfer between indigenous communities across the world.

Based on the growing international market for 'live rock'—limestone that hosts marine life and algae for saltwater aquariums—the project has two main aims: to support economically, socially and environmentally sustainable aquaculture in Tonga, and to extend this experience to potential Indigenous Australian enterprises.

Supported by ACIAR, the Kimberley TAFE Aquaculture Centre in Western Australia recently hosted a nine-day knowledge-transfer course on work practices associated with producing and exporting live rock, based on experiences with smallholders in Tonga. The content included manufacturing the artificial rock base, preparing species for colonisation, harvesting, packing for export and basic trade operations.

"A live-rock aquaculture industry offers a great opportunity for Indigenous [Australian]

communities, because it fits in perfectly with their local understanding of marine systems and their important cultural activities", says Bart Penny of the Aquaculture Centre in Broome.

"Given the physical and social similarities of Indigenous Australian aquaculture to that of the Pacific islands, the knowledge gained through the course [is] invaluable to the development of the industry in Australia," Mr Penny says.

The course was attended by a cross-section of the Indigenous community, including Aboriginal students and potential businessmen from the mid and northern regions of WA and the Northern Territory, who are now one step closer to developing a new industry.

This initiative is similar to various other projects that are extending the successes of ACIAR in the Asia-Pacific region to improve livelihoods and develop business opportunities for Indigenous Australians.

The main areas of ACIAR's involvement with Indigenous communities have been in the fisheries, horticulture, forestry and livestock-production disciplines, where culture, local knowledge and business opportunities are the most closely aligned with those of smallholders in the Asia-Pacific region.

"Particularly where there are similar climates and soils, some of the challenges facing agriculture and the pathways for community development are markedly similar," says ACIAR's Dr Peter Horne.

"Limited land ownership, access to information and linkages with markets are just some of the problems that we are already helping smallholders in the Asia-Pacific region to overcome. If these issues are mirrored in Australian Indigenous communities, then ACIAR should not be letting that knowledge go to waste."

In 2011 ACIAR hosted a forum in Canberra to discuss the potential for increased involvement with Indigenous communities. The forum was attended by representatives of various government organisations, private enterprises and ACIAR project members with knowledge and experience in the area of agricultural research for Indigenous Australian community development.

Ann Fleming attended on behalf of the NT



Jarman and James Xavier of One Arm Point Hatchery mixing up ingredients for making 'live rock'.

Government's Darwin Aquaculture Centre, and is optimistic that ACIAR and the Fisheries Division of the NT Department of Resources can develop a complementary and productive relationship.

"We are partnering with social agencies to identify successful engagement models, and ensuring communities take ownership of the planning, training and implementation of enterprise activities," Ms Fleming says. "ACIAR is the ideal body to address these social aspects and contribute to coastal community resilience."

ACIAR's director corporate David Shearer shares a similar outlook and hoped the forum provided the knowledge and partnerships to make this a reality.

"While former and current projects have been considered a relative success, there remains much to be learned in the way of potential partnerships, strategic engagement and community impact," Mr Shearer says. "We host this forum because we want to understand how we are best placed to assist Indigenous communities.

"But we also recognise that while we have 30 years of experience in the Asia-Pacific, there is still a lot to learn and consider in creating real outcomes for Indigenous people." ■

PARTNER COUNTRIES

PACIFIC ISLANDS

Project: FIS/2006/138 – Developing aquaculture-based livelihoods in the Pacific islands region and tropical Australia

Contact: David Shearer, 02 6217 0548, david.shearer@aciar.gov.au

Innovative charcoal stove for PNG

The ACIAR fuelwood project in Papua New Guinea is trialling the production of charcoal from trees grown by farmers. Charcoal by itself is of limited value, so the project has adopted an innovative, low-cost (about 60 kina, or A\$27) charcoal stove as part of its technology package. It uses a modified galvanised-iron bucket with a concrete internal sleeve to enable charcoal to be used to prepare meals. The stove was developed by researchers at the PNG University of Technology but has not been

widely adopted because of lack of access to charcoal.

In PNG, large numbers of families in rural areas and towns use fuelwood for cooking. The advantage of the charcoal stove is that it will reduce the amount of fuelwood needed by households and improve the health of women who do the cooking, by removing smoke.

The new charcoal stoves and the charcoal made from plantations have been displayed at shows in PNG and have generated



substantial interest. Many stoves are already on order from ACIAR's partner non-government organisation (NGO).

Project partners are looking at how a commercial charcoal-production system could be established to enable widespread adoption of this innovative technology. This could be a charcoal cooperative linking growers, charcoal and stove makers, and sellers. There is already strong interest in this possibility in Mount Hagen.

World Congress on Conservation Agriculture

More than 500 people from about 70 countries gathered at the 5th World Congress on Conservation Agriculture (WCCA) and the 3rd Farming System Design Conference in Brisbane, Australia, from 26 to 29 September 2011.

Conservation agriculture is a sustainable and profitable farming system that is improving farmers' livelihoods through the application of three principles: minimal soil

disturbance, permanent soil cover and crop rotations.

The event involved industry-recognised keynote speakers, workshop sessions facilitated by Australian and international researchers, and a field day at the University of Queensland's Gatton campus. ACIAR graduate officer Keshia Hilliam, who attended the conference, described the mid-congress field day as "a

very interesting day with great presentations, engaging workshops and good demonstrations of conservation agriculture machinery and other equipment".

"With around 70 per cent of Australia's broadacre farming areas under conservation agriculture—a larger proportion than for any other country in the world—we are in a good position to share our knowledge," said ACIAR's chief

executive officer Dr Nick Austin.

There are many benefits of using conservation agriculture as a farming system. The design of more productive, economic and sustainable farming systems assists in meeting the challenges of an expanding population, global change and environmental degradation.

According to participants, the event was a great success.



PHOTO: RURAL PRESS

(From left) Hafiz Mujeeb-ur-Rehman, a Punjab Agricultural Research Board researcher, and Iranian student Aliakbar Solhjoui, from the University of South Australia, look over the Happy Seeder with Professor John Blackwell from Charles Sturt University, Wagga Wagga, NSW, and ACIAR's John Dixon at the WCCA field day at Gatton in Queensland.



ACIAR Policy Advisory Council President Beth Woods (left) and CEO Nick Austin (right) at the Darwin Aquaculture Centre, which showcases practical design in a tropical environment.



ACIAR

30 YEARS IN THE FIELD

In 2012, ACIAR celebrates its 30th year providing agricultural research aid to poor smallholder farmers and rural communities across the Asia–Pacific region and Africa. It is a year to take stock, thank all who have taken part, and map the way forward. We are proud of our achievements, having a track record of almost \$32 billion worth of benefits in 30 years. Look out for the special anniversary issue of *Partners* and visit our website and blog to find out more about our work, achievements and plans.

www.aciar.gov.au

ACIAR Policy Advisory Council visit

The ACIAR Policy Advisory Council (PAC) was established to provide advice to Australia's Minister for Foreign Affairs and ACIAR regarding agricultural problems of developing countries. A substantial proportion of the PAC comprises residents of countries other than Australia in order to ensure the council has experience and knowledge concerning the agricultural problems of developing countries.

To fulfil this role, the PAC meets annually in Australia over several days. This year the council visited Canberra and the Northern Territory from 19 to 23 September 2011 for the annual consultation

meetings. A key agenda item for the joint meeting with ACIAR Commissioners was the outcomes of the Independent Review of Aid Effectiveness.

Council members attended a dinner at Parliament House with the Hon Richard Marles MP, Parliamentary Secretary for Pacific Island Affairs. While in Canberra members were briefed on Australia's carbon farming initiative and met with representatives from the National Farmers' Federation and the Department of Climate Change and Energy Efficiency. They visited field sites where farmers are trialling a new system of integrated

vegetation restoration and grazing without fences.

In the Northern Territory, PAC members visited research institutions and rural industries, and met with ACIAR project leaders and scientists. The tour included the Darwin Aquaculture Centre, Coastal Plains Research Facility, Beatrice Hill Farm Buffalo Breeding Program, the Manbulloo mango farm, Katherine Research Station, Darwin Live Export Facilities, Berrimah Research Farm and Veterinary Laboratories and Charles Darwin University Research Institute for the Environment and Livelihoods.

Impact assessment workshop in the Philippines

The Training Workshop on Social Sciences Concepts and Tools for Technology Assessment and the Research Evaluation and Impact Assessment was held from 25 July to 6 August 2011 at the International Rice Research Institute (IRRI) in Los Baños, the Philippines.

Twenty-three participants came from the Consortium for Unfavorable Rice Environments (CURE) and ACIAR partner organisations in Cambodia, China, Indonesia, Lao PDR, Mozambique, Papua New Guinea, the Philippines, Tanzania, Thailand and Vietnam.

The workshop provided participants with knowledge and skills to evaluate agricultural research, assess the impact of the development and adoption of new technologies, and capture field-level experience through participatory process documentation and

systematisation.

The training workshop was organised by CURE in partnership with ACIAR. Activities included a field visit with farmers in the nearby town of Bay, Laguna, where participants applied what they had learnt in data collection.

East Timor PhD graduate



One of ACIAR's John Allwright Fellows, who is working on a legume crop that is drought- and waterlogging-tolerant, is the first PhD candidate from East Timor to graduate from the University of Western Australia (UWA).

Dr Marcal Gusmao will

use the knowledge gained at UWA to continue working on improving crop yields and training agricultural science graduates in his country.

His doctorate in agricultural science will enable him to pass on methods of improving crop yields

to his students at the National University of East Timor, where he is also working for a United Nations development program on climate change.

East Timor is among the world's 10 poorest countries, with almost half its population relying

Dr Marcal Gusmao (second from left) after his graduation with (from left) the University of Western Australia's Vice-Chancellor, Professor Alan Robson, his principal supervisor Professor Erik Veneklaas and the Dean of the Graduate Research School, Professor Alan Dench.

on subsistence agriculture and enduring a 2–3 month 'hunger season' every year between one harvest and the next.

Dr Gusmao's research involved assessing grass pea which, unlike other legumes, produces a respectable seed yield under stress. He presented his findings at international food legume conferences in Turkey and Syria, thanks to support from ACIAR and a UWA Postgraduate Research Travel Award.

UWA is also involved in a major program to alleviate hunger in East Timor. The Seeds of Life III program—a collaboration between ACIAR, AusAID, UWA and the East Timor Ministry of Agriculture and Fisheries—aims to increase production of East Timor's staple food crops.

Blueprint for improving Indonesian farmers' welfare

Agriculture experts from Indonesia and Australia met in Bogor on 30 November 2011 to identify research projects aimed at boosting the welfare of smallholder farmers.

Participants at the meeting, held as part of ACIAR's country consultations process, looked at scientific projects to boost agricultural production.

During the past year, ACIAR has spent \$8.1 million on supporting research in several areas related to agricultural development. Indonesia is one of ACIAR's largest country programs supported by Australia's aid program because of its proximity and strategic importance to Australia.

"Australia is committed to supporting long-term agricultural research to boost farm production that is essential to improving Indonesian smallholder farmer's welfare," Greg Moriarty, Australia's

Ambassador to Indonesia, told the meeting.

Dr Haryono, Director-General of the Indonesian Agency for Agricultural Research and Development (IAARD), said: "The majority of the poor depend on agriculture for their livelihoods. Agricultural R&D strengthens agriculture, which is critical to our Government's goals of reducing poverty and increasing national production of agricultural commodities which are needed for food, fibre and fuel.

"ACIAR has been supporting Indonesia's R&D work and collaborating with IAARD, the Forest Research Development Agency (FORDA), and the Agency for Marine and Fisheries Research (AMAFRAD) for almost 30 years. I hope this collaboration can continue to be sustained and strengthened into the future," he added.



Ambassador to Indonesia Greg Moriarty (left) with IAARD Director-General Dr Haryono at the ACIAR Indonesia Consultations.

The Bogor meeting was attended by senior officials from Indonesian ministries, including the Ministry of Agriculture and

the Ministry of Marine Affairs and Fisheries, major universities and Australian agriculture and development experts.



John Allwright Fellows and ACIAR program leaders at the Griffin Hotel, Canberra, during JAF week, 2011.

John Allwright Fellows gather

In the week of 26–30 September 2011 ACIAR held the annual John Allwright Fellows meeting in Canberra, with 22 postgraduate students from various universities in attendance.

The meeting provided a good opportunity for the students to get together with their Fellowship colleagues and to meet ACIAR

staff, both socially and in a workshop situation.

At the end of the week each student made a presentation to the group of their research and inquiry to date, including the issue their project is addressing, research questions to be answered, methodology and anticipated outcomes.

NEW STAFF



Andrew Noble is ACIAR's research program manager for land and water resources. Before working at ACIAR, Andrew was the regional director for South-East and Central Asia at the International Water Management Institute (IWMI). During an almost decade-long engagement with IWMI, Andrew also held the positions of regional head and principal scientist South-East Asia, and principal scientist. He previously worked with CSIRO Land and Water in Townsville and CSIRO Plant Industry in Canberra.

Andrew began his professional career in South Africa with the University of Natal and then the Institute for Commercial Forestry Research, Pietermaritzburg. He holds a PhD in agronomy from the University of Georgia, a Masters in Soil Science from the University of Natal, and his early schooling was undertaken in Bulawayo, Zimbabwe. ACIAR's Land and Water Resources Program concentrates on broader-scale aspects of the management of land and water resources by focusing on two themes: agricultural water management and agricultural production and land management in the less favourable areas of Asia.



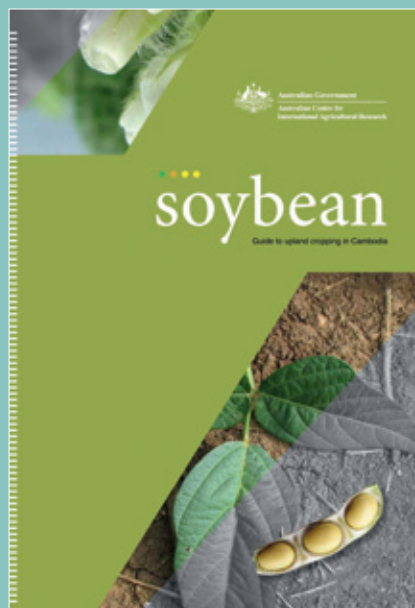
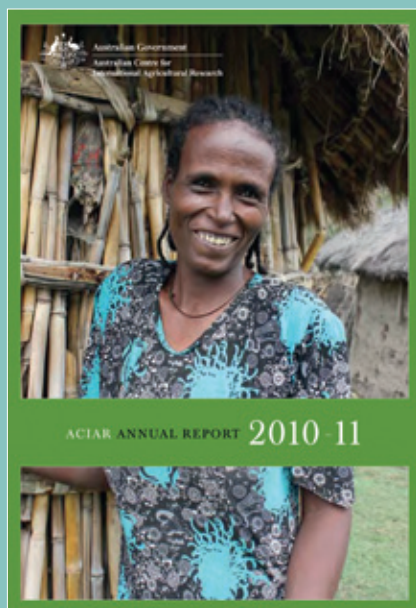
Rodd Dyer is ACIAR's agribusiness research program manager. Dr Dyer comes to ACIAR from Meat and Livestock Australia, where he was the project manager of the northern beef program. His work had an emphasis on supply chain management and agribusiness, both in a domestic and international setting. Rodd holds a PhD in agricultural economics from the University of Aberdeen, undertaken in association with the International Livestock

Research Institute (ILRI). He also holds a Masters of Agricultural Science specialising in rangeland ecology and a Bachelor of Agricultural Science with Honours, both from the University of Queensland. As ACIAR's research program manager for agribusiness, he will manage programs that address the full supply chain for agricultural commodities, including production, postharvest processing and marketing issues. Integrating smallholder farmers into these supply chains is important for long-term food security as supermarkets and other large players continue to further their reach.



ACIAR's knowledge manager is Joanna Hicks. The knowledge manager is responsible for ensuring that the agency complies with Australian Government legislation and guidelines on information and records management and for providing strategic direction for the agency in maximising the use of knowledge produced by ACIAR's research programs.

Joanna has a keen interest in new technologies, information management and business process improvement. She expects to complete her Masters in Knowledge Management in 2013, building on her undergraduate degree in library and information science. Joanna worked in both public and private sectors in research and information roles, mainly in the legal area, until her move to ACIAR.



NEW PUBLICATIONS

CORPORATE PUBLICATIONS

Adoption of ACIAR project outputs: studies of projects completed in 2006–07

David Pearce and Debbie Templeton, CP45, 103pp. \$48 (plus postage and handling)

Annual Report 2010-11 ACIAR, 184pp. Contact ACIAR for copies.

TECHNICAL REPORTS

Sustainable intensification of Rabi cropping in southern Bangladesh using wheat and mungbean

H.M. Rawson (ed), TR78, 266pp. \$60 (plus postage & handling)

PROCEEDINGS

Native forest management in Papua New Guinea: advances in assessment, modelling and decision-making

J.C. Fox, R.J. Keenan, C.L. Brack and S. Saulei (eds), PR135, 201pp. \$60 (plus postage & handling)

IMPACT ASSESSMENTS

Frameworks for assessing policy research and ACIAR's investment in policy-oriented projects in Indonesia

Bob Lindner, IAS72, 68pp. \$40 (plus postage & handling)

Forestry in Papua New Guinea: a review of ACIAR's program Hayden Fisher, IAS73, \$45 (plus postage & handling)

International Rice Research Institute's contribution to rice varietal yield improvement in South-East Asia John P. Brennan and Arelene Malabayabas, IAS74, \$60 (plus postage & handling)

Extending rice crop yield improvements in Lao PDR: an ACIAR–World Vision collaborative project David N. Harris, IAS75, 56pp. \$44 (plus postage and handling)

MONOGRAPHS

A guide to upland cropping in Cambodia: soybean Stephanie Belfield, Christine Brown and Robert Martin, MN146, 72pp. \$40 (plus postage and handling)

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EVENTS

| | |
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| LWR/2011/015 | Potential incentives for sustainable farming for food and water security, and poverty reduction in southern Africa |
| LWR/2011/018 | Egypt–Australia on-farm water use efficiency and water management workshops—Egypt |
| ADP/2011/021 | An extension of research on Indian agricultural markets and competition issues |
| CSE/2011/016 | Contracting options Happy Seeder, NW Punjab—India |
| CSE/2011/017 | Developing a participatory framework for research adaptation and extension for Egypt, and determination of priorities and approaches for embedding this framework institutionally—Egypt |
| FIS/2011/008 | Development of land-based lobster production systems in Vietnam and Australia |
| CIM/2010/048 | Bioinformatics for breeding: data management and cross prediction |
| LWR/2010/033 | Developing capacity in cropping systems modelling to promote food security and the sustainable use of water resources in South Asia |
| FIS/2010/017 | Building mariculture capacity in Papua New Guinea |
| LPS/2010/036 | Support for development of effective TAKE approaches in forage tree legumes research |
| LPS/2010/037 | Support for development of improved TAKE approaches within BBP2TP and BPTP |
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Back cover: Threshing rice at SPA village on the Indonesian island of Sumbawa.

Front cover: A groundnut farmer on Lombok, Indonesia, where ACIAR has been supporting a crop-improvement program to lift the quality and marketability of local production.

FRONT COVER PHOTO: BRAD COLLIS