Australian Government
Australian Centre for International Agricultural Research

NOVEMBER 2010 – FEBRUARY 2011
www.aciar.gov.au

partners

IN RESEARCH FOR DEVELOPMENT

COUNTDOWN TO THE MDGs
FARMER BUSINESS SCHOOLS
NEW LIFE FOR OLD PALMS

FOCUS ON AFRICA

Surpluses create opportunity

The focus on poverty reduction in the past three years has drawn attention to the challenge of achieving lasting food security.

A narrow view of food security is a person having sufficient food calories available each day. More broadly, food security can encompass the production of food surpluses, allowing those living in poverty to sell the excess for income. From that income can come opportunities—for children's education, access to health and gender equity.

Surpluses and income derived from those surpluses are in many ways central to achieving the Millennium Development Goals (MDGs). Without that surplus, little more than subsistence is possible.

Debates around poverty reduction, aid effectiveness and the possibility of successfully achieving the MDGs can be shaped simply by which viewpoint on food security they begin with.

An overview of the changing environment of aid and development over the past decades—10 years after the MDGs were first articulated—begins this edition of *Partners*.

Effective aid programs include an understanding of the possibilities of food security within their design and implement interventions from across the spectrum of food security. For some smallholders this means a focus on boosting productivity of staple crops. ACIAR's engagement in Africa is largely at this end of the spectrum.

The SIMLESA project (page 12) is working to boost the productivity of smallholder maize farmers across five African nations, running in an arc along the Indian Ocean coast from Ethiopia to Mozambique.

That Australian aid is focusing on Africa is not new. ACIAR has been engaged with African nations since the early 1980s and is using that experience in the delivery of its program in southern and eastern Africa. ACIAR's work with smallholder beef producers in South Africa is an example of this continuing engagement and will be central in the design of new projects in the region (page 8).

Lessons learned are also central to another project reported in *Partners* that extends the concept of Farmer Field Schools, a feature of the aid landscape for 30 years. The concept has been furthered through Farmer Business Schools, teaching smallholder farmers how to market their surpluses.

Surpluses and income derived from those surpluses are in many ways central to achieving the Millennium Development Goals. Without that surplus, little more than subsistence is possible.

ACIAR's Agribusiness Program has been a leader in this field, working with the International Potato Center and other partners to help emerging smallholders enter new markets (page 6).

This approach reflects one of the main aims of the Millennium Development Goals—using the possibilities of globalisation as a force for poverty reduction.

ACIAR's programs operate across the food security spectrum, from boosting productivity through to helping emerging smallholders tap into markets. Some projects operate at the village scale, such as a project in Lao PDR on inland aquaculture (page 18). Others are helping smallholders, such as Samson Sonia in Solomon Islands whose story is detailed in this edition, as is work on cocowood in the Pacific and efforts to improve the nutritional quality of the staple crop sweetpotato in Papua New Guinea (page 22).

What links these projects is the ability of research interventions to increase food security and offer opportunity across the Asia–Pacific region and southern and eastern Africa.

NOVEMBER 2010 – FEBRUARY 2011 PARTNERS

ACIAR
www.aciar.gov.au

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 www.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.

ISSN 1031-1009

For further information contact:
ACIAR Communications and Public Affairs
+ 61 2 6217 0500

Letters from readers are welcome, and should be addressed to:

The Editor
Partners in Research for Development, ACIAR
GPO Box 1571, Canberra ACT 2601, Australia

Email: comms@aciar.gov.au

Photos: All photos ACIAR unless credited

The executive editor for this edition of *Partners* is ACIAR public affairs officer Mandy Gyles.

Managing editor: Brad Collis, Coretext Pty Ltd
Associate editor: Dr Gio Braidotti, Coretext Pty Ltd
Design and Production:
Coretext Pty Ltd, +61 3 9670 1168, www.coretext.com.au

coretext

Published by the Australian Centre for International Agricultural Research (ACIAR)
GPO Box 1571, Canberra ACT 2601, Australia

Mixed Sources

contents

Features

ACIAR round up

ACIAR what's new

A shifting landscape

The way Australia participates in global aid and development efforts is shifting as the countdown to achieving the Millennium Development Goals spurs the formulation of new global strategies

The global aid landscape has changed dramatically in the 10 years since the Millennium Development Goals (MDGs) were first announced. Those goals to halve global poverty, overseen by the United Nations, were first announced in September 2000.

Since that time the Paris Declaration, Accra Agenda for Action and emerging partnerships for development have reshaped the principles of aid engagement. Most recently the global food and financial crises have refocused attention on many of the issues relating to poverty.

At the same time a debate has been underway on the effectiveness of aid, including methods for delivering and maintaining development. At the extremes, this debate has even questioned the validity of aid itself.

Yet at the heart of these changes, and central to the debate on aid effectiveness, is the desire to help the one billion people living in poverty find sustainable pathways into a better life.

The Millennium Development Goals were intended as a blueprint to halve poverty in the 15 years between 2000 and 2015. Established through the agency of the UN, the goals link bilateral aid efforts with a collective, multilateral approach.

This strategy fundamentally shifted aid delivery from bilateral engagement to greater integration with the emerging forces of globalisation. It was a recognition that people such as Samson and Janet Sonia of Solomon Islands (see story on page 22) or Ida Rosida of Indonesia (page 6) could either become part of a globalised market-driven world, or be excluded from it.

EFFECTIVE AID

Besides establishing the goals, the Millennium Declaration also signalled a shift from aid to a focus on development as the most effective means to eliminate poverty.

Much of the recent debate on aid effectiveness has focused on this shift and whether aid can catalyse development or become a barrier to development.

Dambisa Moyo, an international economist who writes on the macroeconomy and global affairs, has been a leading proponent of the latter argument. Her book, *Dead Aid: Why Aid is Not Working and How There is a Better Way for Africa*, details an argument relating to the inefficiency of development aid for poor countries.

Aid can become, Moyo argues, a form of economic dependency. "Over-reliance on aid has trapped developing nations in a vicious circle of aid dependency, corruption, market distortion, and further poverty," Moyo states on her website (www.dambisamoyo.com).

Rather than continue the provision of aid to governments, Moyo argues for linking with markets and through this, investment in Africa.

A first step towards changing the existing aid dynamics was taken prior to the publication of *Dead Aid* in 2009, through the Paris Declaration on Aid Effectiveness.

The Declaration was developed at a forum in Paris in February–March 2005. It articulates the responsibility of developed and developing countries for delivering and managing aid. Five principles were developed:

1. Ownership: Partner countries exercise effective leadership over their development policies and strategies, and coordinate development actions.
2. Alignment: Donors base their overall support on partner countries' national development strategies, institutions and procedures.
3. Harmonisation: Donors' actions are more harmonised, transparent and collectively effective.
4. Managing for Results: Managing resources and improving decision-making for results.
5. Mutual Accountability: Donors and partners are accountable for development results.

Australia signed undertakings to align its aid program with the Paris Declaration principles in a number of countries and regions.

The overarching link between the focus on equal partnerships, the MDGs, and arguments to reduce aid dependency is the need to invest in people to help them escape poverty.

That investment is not limited to a financial outlay; it is offering all the world's people basic human rights as the first step up from poverty.

Australia's new Foreign Minister, Kevin Rudd, articulated this case in a recent speech to the Australian Council for International Development (ACFID).

"The MDGs are our best hope, and remain so, for ensuring the forces of globalisation are inclusive—for all of our human family, not just part of it," Minister Rudd said. "Part of the mission of any government committed to the principles of social justice is to give a voice to the voiceless.

"And that is what Australia seeks to do, in partnership with other countries of good conscience, through our aid policy."

A feature of this changing landscape is the development of partnerships operating within or across regions and aligning these with the Millennium Development Goals and the principles of the Paris Declaration.

The MDGs combined with the more recent global food crisis has spurred an increase in aid investment. The Australian Government is continuing to increase its Overseas Development Assistance budget to 0.5% of gross national income by 2015.

These changes have also created a new dynamic in Australian aid engagement in the region, from a focus on what could be provided by Australia to a genuine partnership aligning developing-country efforts with targeted Australian aid. The focus of these partnerships is the Pacific island countries (PICs), through the Pacific Partnerships for Development.

Minister Rudd articulated this process in his speech to ACFID. "While the Partnerships for Development give the analysis and plans to make progress towards the MDGs, the Cairns Compact on Strengthening Development Coordination gives the PICs and Australia the tools to put these plans in place," he said.

"By putting the PICs in the driver's seat in their relationship with development partners and providing the mechanisms for better coordination among development partners, again Australia's objective is to enhance aid effectiveness.

"The Cairns Compact was agreed by Pacific leaders at the 2009 Pacific Islands Forum in Cairns

Bangladeshi farmer Nasima became the sole breadwinner for her family after she lost her husband in Cyclone Sidr in 2007. She continued her association with an ACIAR project to grow alternative crops in her fallow rice paddies to boost income and reduce poverty. She achieved one of the highest wheat yields in her district.

8 WAYS TO CHANGE THE WORLD

THE MILLENNIUM DEVELOPMENT GOALS

Eradicate extreme hunger and poverty

Achieve universal primary education

Promote gender equality and empower women

Reduce child mortality

Improve maternal health

Combat HIV/ AIDS, malaria and other diseases

Ensure environmental sustainability

Develop a global partnership for development

Icons designed by UNDP Brazil©

as a response to Forum leaders' concerns that the Pacific region remains off-track to achieve the Millennium Development Goals by 2015.

"The Compact aims to accelerate progress against the MDGs, by strengthening Forum island countries' leadership of their own development agendas and encouraging development partners to work more effectively together through a process of mutually transparent reporting in the Pacific Island Secretariat."

Australia has reformed 11 of the 13 bilateral aid relationships it has with the PICs and is focusing on delivering a more effective program.

BOOSTING FOOD PRODUCTION

The 2007 global food crisis refocused attention on how tenuous pathways out of poverty remain. Rioting over food made headlines. The reality of the crisis was to push as many as 100 million people back into poverty, as their meagre purchasing power fell behind spiralling food prices.

Attention was also drawn to the causes of that crisis—changing climate patterns causing drought in food bowls, diversion of grain and land to biofuels, falling grain reserves, responses to impose trade subsidies to protect national grain reserves. A pivotal area that had been neglected—research to boost food productivity—was also highlighted.

That crisis, occurring immediately before the global financial crisis, demonstrated that the forces of globalisation—which the MDGs were designed to capture and shape for poverty reduction—could easily become a barrier to poverty reduction.

The World Bank's President, Bob Zoellick, has pointed out that lifting the developing world out of poverty has the potential to act as the next engine of global economic growth.

Achieving that growth is the aim of development assistance globally, in recognition that with growth comes opportunity. The changes in the aid environment over the past decade, driven by the MDGs and the building of real partnerships for development, have made a difference.

Through the provision of targeted investment, development assistance is moving towards catalysing growth in the private economy and private sector to create surpluses, connect people to markets, allow opportunity and promote trade.

The new aid landscape involves partnerships that work together to support the building of the foundations of success—a basic education, access to health and other infrastructure—to enable private economy development and growth.

With five years until the 2015 MDGs deadline, there is a way to go. The emerging aid environment, debates and agreements may ensure that even if the world falls short of its highest hopes for the MDGs, the reshaped aid landscape will maintain momentum for poverty reduction. ■

To market, a new challenge

Modern supply-chain systems are changing the way food is retailed globally, with important knock-on effects for smallholders, and they are also shaping the support provided by ACIAR

BY DR GIO BRAIDOTTI

Two years ago, Ida Rosida of West Java dreamed of augmenting her rural household income. Today, she is a full-time potato-processing entrepreneur whose snackfood products are sold in major city supermarkets.

Marketing her products under the Cumelly brand, Ida specialises in potato chips with the tuber skin intact. The novel product is now available in six flavours and she continues to develop new variants based on suggestions from customers and retailers.

Ida is a key partner in a value-chain that links potato farmers and the urban-based retailers. She was among a group of smallholder farmers and processors who participated in an ACIAR project on market innovations in 2008–09 with the International Potato Center (CIP).

By using the project's participatory market chain approach, Ida began experimenting with new ways to improve traditional Indonesian snackfood products while establishing relationships with potential value-chain partners.

Ida Rosida developed Cumelly jacket potato chips as a way to augment her rural household income.

Harvest farmers group at Padawaas in the Garut District of West Java.

MARKET TRANSFORMATION

Research shows that what happens in the retail supply chain after produce leaves the farm is just as important to food security in developing countries as its production. The finding, by US researchers, is helping to focus attention on the retail sector and the extraordinary transformation brought about by modernisation in supply chains.

With the emergence in the past 10–20 years of specialised wholesalers, centralised logistics, high-capacity processors and modern retail practices has come new efficiencies that are reshaping the relationship between farmer, retailer and consumer in developing countries. Understanding the impacts on the world's smallholder food producers is a major concern of David Shearer, ACIAR's agribusiness program leader.

The program is addressing the results of a study by Dr Tom Reardon, from Michigan State University, which show that post-farmgate retail accounts for 50–70% of the price consumers pay for food. To Dr Reardon, this means that efficiencies brought by modernisation of the supply chain are just as important to food security as raising on-farm yields.

"The food security debate has focused on farm production and productivity, and while this is necessary, it is not sufficient," Dr Reardon said when addressing the 2010 ASEAN Food Security Conference. "There are efficiencies to be had in wholesale, logistics, processing and retail that can have as much—or more—impact on food security."

Mr Shearer says modernised supply chains across Asia are letting modern retail outlets provide commodity food cheaper to consumers. For example, supermarkets in Delhi charge 15–20% less for basic staples such as rice and wheat and 10% less for basic vegetables compared with traditional retailers.

"In terms of a food security strategy, we need to start understanding the post-farmgate price-forming processes and the beneficial effects of modernisation," Mr Shearer says. "That is something ACIAR's agribusiness program wants to pursue so that we can help smallholders capture benefits from changes in retail, including moving into new markets that meet changing consumers expectations about food safety, quality and where or how food is produced."

The challenges confronting farmers from the influences of supply-chain change on demand, supply and a farmer's location in relation to markets are substantial. Smallholder farmers in particular will need help in meeting these challenges before they can be transformed into opportunities.

SUPPLY AND DEMAND

Unlike traditional supply chains, the modern retail processing and wholesale sector can monitor, contract, trace and store food efficiently. Along with this extra capacity comes a substantial incentive to avoid liability while capturing profits from goods with superior quality and variety. Mr Shearer says these factors are combining with changing consumer expectations to produce two trends of interest to ACIAR:

1. Modernised supply chains can drive down consumer food price, reduce risk and variability in food supplies and drive waste and inefficiency out of the system.
2. Modernisation potentially improves food quality and safety, reducing exposure to contaminants on fruit and in milk-herd feed, disease in poultry, and tainted fish from poor supply-chain practices.

"The modern sector is the only segment that has the incentive and capacity to accomplish these improvements," Mr Shearer says. "But with changing circumstances come both challenges and opportunities for smallholders."

Farmer Business Schools help small-scale farmers to be full players in value market chains.

PHOTO: INTERNATIONAL POTATO CENTER

DEDICATED WHOLESALERS

The emergence of wholesalers—which specialise in one particular commodity and organise all the logistics and distribution for that food item's retail sector—is one driver that is changing how farmers interact with the market. So, too, are modern retailers and processors as they drive market growth and product differentiation.

"Dedicated wholesalers emerge as 'advocates' and 'agents' for retailers and processors and go beyond what traditional wholesalers do," Mr Shearer says. "They can help farmers to get in contact with and contract to supply modern operators. They can guide farmers and provide infrastructure, such as collection centres, in rural areas."

Product differentiation can include 'credence attributes', such as certification for safety, environmental or ethical standards. Certification can be an important investment, Mr Shearer says. It generates incentive and protection and, for smallholders, the challenge to adopt new varieties or technology.

"Dedicated wholesalers and modern retailers want to select those farmers with capacity to meet their needs, requirements and standards," Mr Shearer says. "These requirements are hoops to jump through—threshold investments—and thus a challenge for poor smallholders."

REGIONALITY

One such challenge is that modern retailers can also access regional networks, bringing in produce from efficient farmers in other zones, such as those from China and Thailand, to compete against local produce. Market modernisation, therefore, can provide increased market access for some farmers but at the same time, more competition for others.

'Regionality'—where food comes from, how it is produced and how it is brought to market—is especially important in Asia, where locally produced fare can be highly valued by consumers.

Examples of these are rice from the Basmati region of India and Indonesian supermarkets that routinely let consumers know where their fruit was grown, so that local delicacies can be identified.

In the process, production channels develop that make it possible for smallholders to link to the market and receive premiums. But in the absence of certified supply chains, both integrated and regional food supply chains are open to exploitation.

FARMER BUSINESS SCHOOLS

In ACIAR-funded projects, devising tools to help farmers deal with these emerging market issues has become an activity that is being routinely incorporated in the provision of technical assistance.

For Mr Shearer, ACIAR's regional approach to research partnerships is a big advantage for this agribusiness effort. When government support and services for farmers are lacking, there is always the possibility of forging links with Australian firms in joint venture with in-country partners.

"Over the past 30 years an approach called Farmer Field Schools, which help deliver technical innovation, has been developed," Mr Shearer says. "I now want to adopt that approach and evolve it to deal with supply chain issues in the form of Farmer Business Schools or FBS."

He has five projects on the ground in Asia establishing trial Farmer Business Schools. Teams involved in these projects are expected to link up in early 2011 at a workshop in Indonesia to share experiences and contribute to developing principles that can be adopted in other projects, be it by ACIAR, international donors or national governments. Taking part will be representatives from Indonesia, Vietnam and the Pacific.

"Through the Farmer Field Schools, growers were saying they wanted to engage more with marketing issues," Mr Shearer says. "The Farmer Business School is about making research into these issues available to farmers in ways that allow them to interact positively with partners and markets.

"One of our projects with the CIP is already at the forefront of our thinking around FBSs. It operates in Indonesia with a sociologist leading the project rather than a technician."

SMALLHOLDER FOCUS

Across the ACIAR agribusiness program, activities are focusing on responses to each of the components that are changing the delivery of food to consumers—retail modernisation, 'credence attributes', 'regionality' and changing consumer expectations.

Ultimately, research shows that farmers can both win and lose with food supply chain modernisation.

Ensuring that asset-poor smallholder farmers benefit from these changes is the challenge facing Mr Shearer and his teams.

He believes changes in food retailing in emerging economies can be a positive influence on the quest to reduce poverty, but the world's smallholder farmers need the same level of help that has lifted their productivity to now help them operate in a modernising supply chain. ■

Farmers at Lwala Lemeets, Limpopo Province, South Africa.

PROOF OF PROFIT USHERS IN EQUALITY

A value-based R&D model that helped smallholder South African beef farmers manage and market their cattle more profitably is now proving effective for improving profits for beef producers in Australia and New Zealand

PHOTO: DEBBIE TEMPLETON

BY DR GIO BRAIDOTTI

There can be nothing more frustrating to agricultural scientists than seeing R&D fail to benefit farmers because it lacks practical applications or simply meets with disinterest. When the research is aimed at helping some of the world's poorest subsistence farmers, that failure is especially damning.

ACIAR leverages Australia's agricultural expertise to help make farming innovation more accessible to the world's poorest farmers.

Over the years, ACIAR has trialled various research, development and extension (RD&E) approaches but recently achieved spectacular results in South Africa with a project to improve the profitability of smallholder beef producers. Project leader and CEO of the Beef Cooperative Research Centre (CRC) Dr Heather Burrow co-opted continuous improvement and innovation (CI&I) experts to join the project.

Aimed at poor black South African beef producers, the project ran between 2001 and 2006 and helped increase the income of participating farmers from an average of 1,379 rand (A$210) to about 44,000 rand (A$6,600) a year. The impact amounted to an increase in profitability of more than 300%.

The outcome was so striking that the South African Government has since mandated the use of the CI&I process for its own programs to improve resource-poor agriculture. It is now used in the South African beef, sheep, goat, horticultural and dairy industries.

The benefits from the CI&I approach continue to grow as it is adopted internationally. In 2006, the Beef CRC established CI&I partnerships with beef producers in Australia and New Zealand. While it is still early days for this trans-Tasman project, the CI&I approach has already helped some farmers increase profitability by more than 20% annually (see side story, page 10).

CONTINUOUS IMPROVEMENT & INNOVATION

Dr Burrow says that when ACIAR asked the Beef CRC to join a development project with South African farmers, she was keen to involve CI&I expert Dr Richard Clark because of his focus on achieving industry-relevant outcomes. "The CI&I process he developed for the ACIAR project is called Beef Profit Partnerships (BPPs)."

These partnerships saw technical specialists network with teams of farmers, initially in two South African provinces—Limpopo and North West Province—before expanding to Gauteng, Mpumalanga, Free State and Eastern Cape provinces.

The project was implemented in South Africa by researchers from the Agricultural Research Council (ARC) and the departments of agriculture in Limpopo and North West provinces, led by Mr Ephraim Matjuda of the ARC's Irene Animal Production Institute. Partnerships involved both communal (subsistence) and emerging farmers (resource-poor producers wanting to enter commercial markets).

"We were aiming to improve profits in 14 farmer teams in two provinces by 5% a year," Dr Burrow says. "But clearly the project


Project leader and CEO of the Beef CRC Dr Heather Burrow.

PHOTO: PAUL JONES

exceeded that expectation by quite a margin."

Dr Clark, from the Queensland Department of Employment, Economic Development and Innovation (DEEDI), explains that CI&I is a way to ensure that R&D activities achieve practical solutions and improvements in real-world systems. Unlike traditional (or 'first generation') research models that can struggle to have an impact outside the laboratory, CI&I draws on fourth-generation R&D or fifth-generation innovation models.

"In the CI&I scheme, it is important that all participants are clear about their values, intentions and principles," he says. "These provide a framework in which to continuously assess and finesse a project, guiding it towards achieving the required outcome.

"So for the ACIAR project, I was in South Africa with one purpose: to help previously disadvantaged farmers improve their business performance. That was their target outcome. And research shows that being clear about one's intentions is crucial if a project is to succeed. You have to keep the end in mind, right from the outset."

Consequently, participants were required to look for and measure impacts continuously during the life of the project to ensure it remained on track. And in South Africa, that caveat applied as much to farmers as to researchers.

Dr Clark designed an assessment tool for farmers based on gross margins. These involve calculating costs and benefits to check whether innovations were likely to return a profit.

"With subsistence farmers—even if they do not have pen, paper or a lot of formal education—most own a mobile phone which can function as a gross margin calculator," Dr Clark says. "So we showed farmers how to calculate a gross margin. It is a simple tool, but it is applicable to every farm management recommendation. And it allows farmers to quickly pick and choose options that stand the best chance of achieving success—especially when they are poor."

As researchers made their agricultural science expertise available to BPP teams, farmers were supported to assess, and reject, any recommendation unless it improved their profits by at least 5%.

"Farmers liked this approach—I can say that because we actually measured their response and satisfaction," Dr Clark says. "If they had not liked it, CI&I allowed us to detect their concerns and adapt the approach. There is real interdisciplinary science behind CI&I partnerships. Apply it rigorously and it will work."

BEEF PROFIT PARTNERSHIPS

During the five-year project, farmers came to realise that animals have different market value despite costing the same to feed, so they started to experiment with different herd-management options. Dr Burrow says the shift was from running their animals in the manner of a bank account—tapped only in times of emergency—to a more business-oriented approach that, for example, saw weaner calves routinely sold at their commercial prime.

The results were fewer animals and a surprising knock-on effect to the environment. "As farmers started to turn off some of their cattle, suddenly there was less pressure on forage and herds had more feed," Dr Burrow says. "So the weaning weight went up, so did the reproduction rate … there were all these spin-off benefits that we were not necessarily measuring at the time, but were dearly welcomed and cultivated."

Over the years the Beef Profit Partnerships worked on various issues impeding the farmers' ability to run profitable businesses—primarily market access, herd management and the basic genetic resource represented by their indigenous breeds of cattle.

Concurrent to the farmer development activities, the project also undertook animal experiments to identify whether cattle from poor farmer herds could meet the demanding specifications of South Africa's commercial beef markets.

MARKET ACCESS

Dr Burrow says that South Africa's commercial beef industry is as sophisticated as any beef industry in the world. However, BPP farmers have always struggled with market access due to perceptions among commercial stakeholders that their cattle are not suited to commercial markets.

"Over two years, we sourced cattle from communal and emerging farmer herds at weaning and compared them head-to-head with commercial, nondescript (Brahman crossbred) and selected Bonsmara steers in a commercial feedlot," Dr Burrow says.

Although the animals from the communal and emerging farmer herds were significantly lighter than the commercial cattle at weaning, once they were given access to high-quality feedlot rations the study found they performed just as well as commercial cattle. The cattle grew at a similar rate and had similar feed efficiencies.

"Incidence of disease (primarily bovine measles) was low in cattle from all herds,

PARTNER COUNTRY

Republic of South Africa

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

CONTACT: Dr Heather Burrow, heather.burrow@une.edu.au

negating the widespread belief that disease levels in communal and emerging farmer herds were high," Dr Burrow says. "Tenderness of meat was equal to that of the selected Bonsmara steers and significantly more tender than that from the nondescript commercial cattle."

The study made it clear that cattle from emerging and communal farmer herds had the ability to meet the requirements of South Africa's commercial beef markets, providing they were managed under production systems similar to those used by commercially oriented farmers.

There remains, however, a certain stigma associated with animals from the communal farmer herds. Many of these cattle are from the Nguni breed traditionally managed by the Zulu tribes. The Nguni are a small, resilient breed with beautiful, multicoloured hides, which are used to produce culturally and commercially valuable leather goods.

"At the start of the project it appeared that not only were the farmers being discriminated against but so were their cattle," Dr Burrow says. "However, our experiments were able to clearly show the Nguni cattle have special attributes such as high reproductive rates under harsh environments, good resistance to heat and parasites and offer very acceptable meat quality.

"This makes them potentially useful for breeding animals not only for South Africa, but also for other tropical areas in the world if the genetically superior individuals can be identified. This would open up an entirely new

South African beef cattle raised in a feedlot system in Limpopo, South Africa.

The farmer committee meet to discuss ways to improve livestock profits.

Rebound benefits to Australasian farmers

Beef Profit Partnerships (BPPs) have been operating in Australia and New Zealand since 2006. Janice Timms, from the Queensland Department of Employment, Economic Development and Innovation, has helped manage the BPP project since its inception, and the University of New England's Dr Garry Griffith has recently analysed its impacts.

The program currently involves 25 BPP teams made up of 250 beef businesses and more than 600 partners.

Ms Timms says that BPPs give producers the opportunity to form teams with other beef business managers and network with people who actually make up the beef industry, including feedlot operators, processors, consultants and technical specialists.

"Improvement options can mean optimising pasture, animal health, animal genetics, compliance with market specifications or any number of other options," she says.

Analysis undertaken by Dr Griffith has found that for 58 businesses which had measured farm profit for 2 years or more, year-on-year comparisons showed 60% were beating the comparable regional industry average by more than 5% while 22% were beating it by more than 20%.

"More than 275 improvement options have been assessed by BPP members," he says. "Over 120 improvements and innovations have been or are being implemented, and more than 500 practices, technologies and tools have been trialled, each with measurable impacts on productivity and profitability at individual beef business level."

Preliminary economic impacts of these changes have been modelled. These found:

- **The average improvement achieved across five North Queensland BPPs (comprising 26 individual beef businesses) due to BPP interventions was about $14 per adult equivalent (AE) for breeding stock and about $43/AE for sale stock.**
- **These North Queensland businesses control some 140,000 AE cattle. Hence the annual improvement in profit to these businesses alone was more than $2.3 million a year.**
- **There are about 630,000 cattle in the North Queensland region, so the potential regional impact of BPP interventions is about $3.7 million a year at the 25% expected adoption levels for Beef CRC extension packages.**

and potentially profitable market for the owners of those cattle."

BUILDING NEW OPPORTUNITIES

While ACIAR's Dr Peter Horne is thrilled with the project's success, he believes there is still an important question to be answered: whether the agribusinesses being built by smallholder beef producers could ultimately access and profit from large urban or even international markets. So the work in South Africa continues, with ACIAR in the process of developing new projects partly based on the result of a more recent study completed by the Beef CRC and its partners in South Africa.

"In that study, taste-panel tests involving 700 urban and rural consumers were undertaken using cattle from communal and commercial herds," Dr Burrow says. "Results from that research proved consumers were not able to distinguish the smallholder cattle from commercial cattle based on either beef quality or tenderness." (ACIAR Technical Report 72.)

Growing out of that study is a new project looking at customising supply chains to improve the commercial viability of smallholders as agribusinesses … an idea that has caught the attention of South Africa's neighbours.

Recently, ACIAR hosted the President of Botswana, Lieutenant-General Seretse Khama Ian Khama to discuss the possibilities to promote market access for Botswana's small-scale cattle producers—farmers who hold about 80% of the nation's beef.

"Botswana presents a fascinating opportunity for small-scale beef producers," Dr Horne says. "Botswana has preferential access to the lucrative European beef market but they are unable to fulfil the demand from feedlots.

"So Botswana is in a similar situation to South Africa, asking how smallholders can access large commercial markets for beef. Given the nature of ACIAR's focus on poor farmers, it is exciting to find that that opportunity exists here in Africa … if only we can develop the farmers' capacity to meet commercial market requirements." ■

The continuous improvement and innovation (CI&I) process

The CI&I process encouraged beef farmers to set their own priorities for developing and managing their business enterprise rather than being told what to do by the scientists. The process has clear steps that help focus thinking and action, allowing people to work in partnership to improve farm profitability.

STEP 1: SITUATION ANALYSIS
What is the current situation, considering current practices and performance?
What are the opportunities for improvement and innovation?

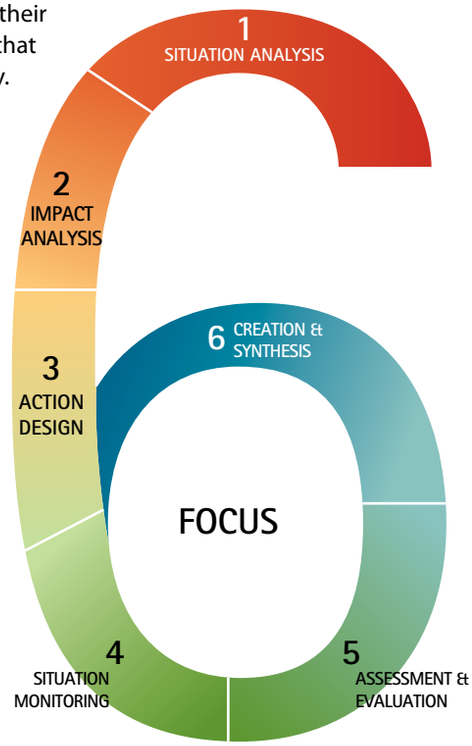
STEP 2: IMPACT ANALYSIS
Which opportunities will make a real difference to the situation?
What criteria and evidence do we have to decide which opportunity to invest in?

STEP 3: ACTION DESIGN
What specific actions do we need to implement to make a real difference?
How will we measure the effects of our actions?

STEP 4: SITUATION MONITORING
What specific actions am I and others taking?
How are we tracking the effects of our actions?

STEP 5: ASSESSMENT AND EVALUATION
What happened as a result of our actions?
What made a real difference? Why?

STEP 6: CREATION AND SYNTHESIS
What new questions and ideas do we now have?
What new and different needs and opportunities should we focus on next?



A BPP group at Ebor, NSW, sharing knowledge on forage brassicas.

Africa recruits research part

East African farmers are spearheading a research drive to intensify crop production of their most important staple foods. The farmers' experiments with conservation agriculture and variety selection are part of a broader, five-country push to stave off a looming food and soil-health crisis

BY JUDIE-LYNN RABAR AND DR GIO BRAIDOTTI

Kilima Tembo is a secondary school in the Karatu district in Tanzania's rural highlands. Here, near the Ngorongoro Crater and Tarangira National Park, agriculture is king and food security rests squarely on grains grown in the region's maize–legume intercropping system.

So important is farming to the community that the school has an agriculture teacher and the school head, Ms Odilia Basso, has allowed the Selian Agricultural Research Institute (SARI) to use school grounds to run field trials as part of a five-country initiative to overhaul the maize and legumes supply chain—from farm to market.

That means breaking with a long-standing cycle of lifting production simply by bringing more land under the plough. The ecological consequences of that approach are catching up with farmers and their environment, but agricultural science is providing more sustainable alternatives to improve food security.

The research-based strategy is called SIMLESA—sustainable intensification of maize–legume cropping systems for food security in eastern and southern Africa. Launched in March 2010, the project is supported by the Australian Government through ACIAR.

AMBITIOUS AIMS

A major objective is to introduce conservation agriculture techniques and more resilient varieties to increase the productivity and resilience of this vital cropping system. SIMLESA is aiming not only to increase yields by 30% from the 2009 average but also to reduce, by the same factor, risk from yield variability between seasons.

The Kilima Tembo Secondary School will help achieve these goals. The school is hosting the so-called 'Mother Trial'—a long-term SARI field trial of conservation agriculture. This farming practice involves conserving ground cover between harvests to preserve soil moisture and, over a number of years, radically improve soil health and fertility.

Unlike 11 other farmer-led field sites established by SARI (the so-called 'Baby Trials'), the Mother Trial is managed directly by the institute's scientists, landing the school's students with front-row seats on research and development activities designed to sustain a farming revolution.

Mr Bashir Makoko, an agronomist working on the SIMLESA project, says students have the opportunity to learn about the project and its significance to the community at an open day with scientists and extension workers from SARI.

The socioeconomist running the trial, Mr Frank Mbando, is encouraging student participation. He has arranged for data to be collected in ways that allow students to interact with technical staff. "Direct involvement in the project will equip the students with the information they need as potential farmers," he says.

HOUSEHOLD AND REGIONAL IMPACTS

Supporting these activities are partnerships that link farmers with a suite of national resources—extension officers, research centres and agricultural ministries—and international research centres.

Coordinating these linkages is Dr Mulugetta Mekuria, from the South African regional office of the International Maize and Wheat Improvement Center (CIMMYT). Also involved is the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

Dr Mekuria says SIMLESA was designed to have impacts at both the household and regional level.

"The aim is to ensure food security through agricultural research, stronger economic

ners to secure its food

PHOTOS: CIMMYT

1. ACIAR's Dr John Dixon and Dr Daniel Rodriguez, of the Queensland Alliance for Agriculture and Food Innovation, with farmers from Melkassa, Ethiopia.
2. A maize–legume farm in Tanzania.
3. Government extension officer Frank Swai, Tanzania.
4. Farmer and single mother of four Felista Mateo, Tanzania.
5. CIMMYT's Dr Fred Kanampiu, Tanzania.

institutions, partnerships and capacity building," he says. "We want to increase food security and incomes while driving economic development through improved productivity from more resilient and sustainable maize-based farming systems."

To implement the program, Dr Mekuria is using the '3-I Approach', a research for development (R4D) strategy designed to enhance smallholder prosperity based on the principles of integration, innovation and impact. "SIMLESA activities will focus on integrated cropping systems, the use of innovation platforms to test and promote promising practices, and ensuring positive and measurable impacts on food security, sustainability and farm household incomes."

ACIAR is funding SIMLESA with $20 million in financial support. The centre has enlisted Australian expertise through Dr Daniel Rodriguez, of the Queensland Alliance for Agriculture and Food Innovation, and Professor John Howieson from the Institute for Crop and Plant Sciences at Murdoch University in Perth.

POSITIVE EXPERIENCE

Ms Felista Mateo, a 37-year-old farmer from Kilima Tembo village is already benefitting from participating in SIMLESA.

A single mother of four, Ms Mateo supports her family with produce from her land, mainly maize and pigeon pea. Any surpluses, though small, are stored in granaries and either used domestically or sold to middlemen.

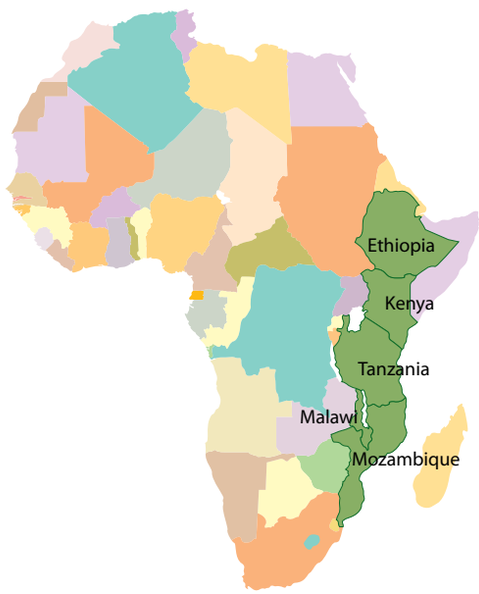
Following advice from government extension officer Mr Frank Swai, she achieved yield gains that her neighbours are now attempting to duplicate. As her harvest increases, she plans to build a larger granary to store her surplus and sell more grain as a cash crop.

Traditionally, farmers have had no way of tracking the market and the middlemen who buy their produce have exercised control over prices. However, Ms Mateo owns a mobile phone and since the inception of SIMLESA and its support network, she can now call an extension officer and check market prices. The result is greater bargaining power for the villagers when the middlemen come calling.

AVERTING FOOD INSECURITY

More than 200 million people living in extreme poverty in the partner countries stand to benefit from SIMLESA.

Currently, the region is barely self-sufficient



PARTNER COUNTRIES

Ethiopia, Kenya, Tanzania, Malawi, Mozambique

PROJECT: CSE/2009/024: Sustainable intensification of maize–legume cropping systems for food security in eastern and southern Africa (SIMLESA)

CONTACT: Mulugetta Mekuria, Program Coordinator, +263 912 469 211, m.mekuria@cgiar.org

in grain, importing 10% of its needs—one-quarter in the form of emergency food aid.

Maize is the main staple and legumes—primarily groundnut, pigeon pea and chickpea—are an important source of protein. Instead of a more prosperous future, however, the region is facing growth in demand for maize and legumes in the next 10 years. It is that trend towards food insecurity that SIMLESA is attempting to avert.

Socioeconomist Frank Mbando, Tanzania.

PHOTOS: CIMMYT

Senior agronomist Tuaeli Mmbaga, Tanzania.

"The way forward will include training farmers to provide them with further education on how to manage their land."

–TUAELI MMBAGA

But it is not just on-farm practices that are targeted for innovation. Urban grain prices have remained stubbornly high following the global food crisis of 2007–08. But higher prices for consumers have not translated into higher prices for farmers. This has weakened incentives for farmers to increase food crop production, a state of affairs that SIMLESA is attempting to change.

CIMMYT's Dr Fred Kanampiu says that the SIMLESA project is aiming to achieve a 'whole-chain' impact. "Despite the multiple efforts underway with the researchers, the final focus should not be lost," he says. "It is the farmer who is to be the end beneficiary of the research. The farmers' lives should be improved, their pockets well-lined and their families well catered for."

Of all the crops produced by farmers such as Ms Mateo, it is pigeon pea that has an important role to play as a cash crop. Farmers are fond of this legume because it yields two harvests a year and there is a good export market to India. Pigeon pea retails up to TZS150,000 (about US$100) per 100 kilogram bag. On average, one acre (0.405 hectares) of land yields 300–400 kg of pigeon pea. Typically, 95% of the crop is sold.

In Karatu district some 15% of farmers live on less than a dollar a day. Mr Makoko says the major obstacles to lifting their profitability are high inputs cost, low produce prices, lack of markets and prolonged drought. By introducing pigeon pea or similar crops, and integrating the 'whole-chain' approach, these obstacles can be reduced or overcome.

BETTER VARIETIES

While the main research thrust is on conservation agriculture, CIMMYT and ICRISAT are participating in accelerated breeding and performance trials that aim to introduce farmers to maize and legume varieties that yield well in good years and are resilient enough in the bad seasons to help reduce farmers' risks.

Mr Mbando is tracking impacts associated with the new varieties and says the farmers' response to the studies has been positive.

"They suggested that breeders take into account farmers' criteria when making selections, so a participatory approach will be used to evaluate varieties," he says. "So far, farmers have indicated early maturity, pest and disease tolerance, high yields and marketability as the preferred traits. Variety registration and production will then also be stepped up to make the seed available in sufficient quantities."

PARTNERSHIP APPROACH

Mbulu district, located about 50 kilometres from Karatu, is the next community targeted for SIMLESA activities in Tanzania, to start after the current crop has been harvested. At the SIMLESA inception meeting, farmers agreed to leave postharvest residue on the ground in preparation for the trials. Field activities in the Eastern Zone districts of Gairo and Mvomero are expected to begin in the next growing season.

Ms Tuaeli Mmbaga, the senior agronomist on this project, says that with support from extension officers, farmers will assess the technology both preharvest and postharvest.

"The way forward will include training farmers to provide them with further education on how to manage their land," she says. "This will include an Innovation Learning Platform in partnership with farm produce stockists, community leaders and other stakeholders to ensure that more people become involved with the project."

Crop modelling scientist Dr Daniel Rodriguez, who leads the Queensland component of ACIAR's SIMLESA program, is convinced that research to reduce food shortages in eastern and southern Africa could have many benefits for farmers, including in his native Queensland.

"Our scientists will be working to improve the resilience and profitability of African farms, providing access to better seeds and fertilisers to raise the productivity of local maize–legume farming systems," Dr Rodriguez says. "Together we may be able to help solve one of the greatest challenges for the developed world—eliminating hunger and poverty in Africa—while at the same time boosting legume production here in Australia."

BUILDING AGRICULTURAL RESEARCH CAPACITY

ACIAR's Dr John Dixon says the emphasis of Australia's direct involvement is on building capacity within the African agricultural research system.

"Conservation agriculture amounts to a substantial shift in farming practices for the region," Dr Dixon says. "But it stands to provide so many advantages—not just greater water-use efficiency and soil health but also opportunities to break disease cycles and improve livestock nutrition."

These are long-term efforts that need to be adapted to many agroclimatically diverse locations, Dr Dixon says. "So it is vital that the African agricultural research system is built up so that it can take lead responsibility for implementing innovation into the future." ■

Loading coconut stems for the mill in Savusavu, Fiji.

PHOTO: DEEDI

PACIFIC'S TREE OF LIFE TO RISE AGAIN

With a little help from scientists, Pacific islanders find a way to profit from five million non-productive 'senile' palms

BY MELISSA MARINO

Imagine coconut palms and many people think of tropical islands and lazy holidays in the sun, not suburban homes or sophisticated European buildings. But ACIAR-funded research may change that perception to the benefit of Fijian and Samoan farmers.

A joint Australia–Fiji–Samoa project is helping to transform nonproductive senile palms that are of no value to farmers into quality building materials, suitable for high-value flooring, benchtops and furniture.

PARTNER COUNTRIES
Fiji, Samoa

PROJECT: FST/2004/054 Improving value and marketability of coconut wood

CONTACT: Dr Henri Bailleres, henri.bailleres@deedi.qld.gov.au, www.cocowood.net

Cocowood from these palms not only offers a distinctive building product but, in a reinforcement of the coconut palm's status in the Pacific as the 'tree of life', it could provide a new income stream for farmers from unproductive older palms that would cover the cost of removing the senile palms and free up land for more productive uses.

In a secondary outcome, the project has revealed the soft, nutrient-rich core of the palm's trunk makes an ideal mulch that could be used across the Pacific to improve poor soils and further increase agricultural prospects for islanders.

Leading these efforts to assist Pacific island communities is Dr Henri Bailleres from Queensland's Department of Employment, Economic Development and Innovation (DEEDI). Dr Bailleres says he is constantly amazed by the fact that every part of the tree can be used. "Each time I work with it I find new uses," he says.

With senile palms providing little to farmers but a hygiene risk and a waste of land resources, the completed 4-year project analysed cocowood's material properties, developed suitable processes for producing high-value products and provided hands-on training in those processes.

SECURING SUPPLIES

Cocowood has proven to be such a success that the fledgling industry's biggest challenge now is to create a secure supply chain to meet demand for the product, which is already being used in upmarket homes and hotels in the Pacific.

It is a challenge that ACIAR forestry research project manager Tony Bartlett is looking to meet by developing a project through AusAID's Pacific Agribusiness Research for Development Initiative (PARDI) to help establish a system to deliver coconut logs to processors.

Although there is not yet a broad business model in place, Mr Bartlett is upbeat about the prospects. "I'm quite optimistic because there are a lot of senile coconut plantations in the Pacific and the science that has come out of this project really does demonstrate that there's a valuable product that can be produced from these palms," he says.

"And that could generate enough income for the landowners to get the senile palms cleared and then to decide whether to replant them with improved coconut trees or some other high value use such as taro production or agroforestry systems."

PROCESSING CHALLENGES

The ACIAR-funded project was the first important stage in the development of a new industry, says Dr Bailleres. Its science went back to basics, beginning with the palm itself.

Previously, he says, the coconut palm had been processed as if it was classical timber, but it is different and has to be treated as such. First, he says, the palm is not technically a tree (instead belonging to the grass family) and second, its 'wood' density varies so dramatically that one single stem covers the entire density range found across the whole timber industry from balsa to ironbark.

"This variation causes problems with machinery and drying, so that's why we decided to go right back to basics and look at the cocowood properties and what that means in terms of processing," Dr Bailleres says.

The close examination of its properties revealed the cocowood's dramatic grain angle variation was the product of an interlocked and layered grain structure, formed in a spiral resembling a triple helix. It is a design feature evolved over millennia that makes the palm resistant to cyclonic winds, but prone to twisting in the kiln.

By identifying the cocowood's triple-helix structure, light has been shed on how to most efficiently saw boards from the trunk and master problems of twisting during drying.

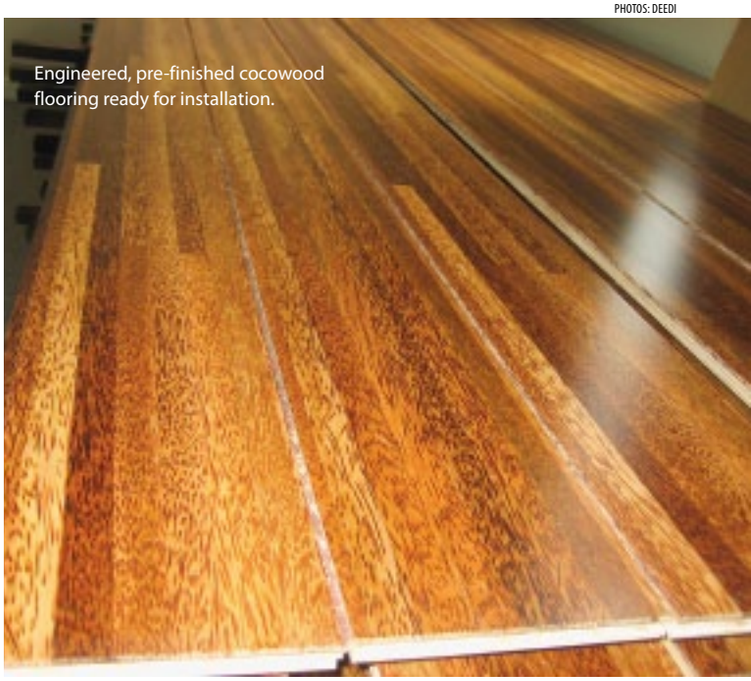
The drying process that has been developed now not only meets moisture content specifications for export markets, but combats the tendency of the wood to warp by using weights to minimise distortion.

"First of all you have to cut the boards in the right direction and when you dry them you have to weight the stack to make the board stay straight," Dr Bailleres says. "This is very important because flooring people can't accept twisted boards."

Training sessions on these processes, part-sponsored by the Crawford Fund, have been held in Brisbane and Fiji with local processors, who also learned on the job as the researchers were trialling the systems. A practical user manual on cocowood processing techniques was also produced as part of the project and is available online.

PHOTOS: DEEDI

Measuring growth strain in cocowood, Fiji.



Engineered, pre-finished cocowood flooring ready for installation.

Preliminary trials were also conducted into what is known as veneering, where a lathe is used to peel layers of wood that can be glued together to make composite flooring products or plywood. Dr Bailleres has proposed a new ACIAR-funded project to further explore veneer production from coconut palms.

These new opportunities have come about because of a greater understanding of the coconut palm as a result of the research, Dr Bailleres says. "Understanding what is inside the tree, how it grows and what its structure is helps us go in the right direction for processing and utilisation."

It was the careful analysis of the coconut palm's make-up that also revealed new information about why it was prone to blunting processing machinery.

Previously it was thought, as with other timbers, that excess silica was the cause. The project revealed it was not silica levels but the combination of several other minerals that was the cause. Knowing this improves the handling of cocowood as the alloy in the processing machinery is adjusted to cope.

MULCHING POTENTIAL

To Dr Bailleres this finding was not a surprise, as he already knew the soft sap core of the coconut palm, which flows from the centre to the outer part of the trunk, was full of minerals and nutrients.

What he did not know, but was revealed through the project, was that this soft core could be put to secondary uses, including as high-grade nutrient and organic matter to improve poor soils in the Pacific. Further development of its mulching potential has been proposed for future ACIAR research and Dr Bailleres says it is an exciting prospect for the region.

"In a lot of Pacific islands the organic part of their soil is very poor and they need organic matter to grow different products," he says. "This is a very good opportunity for the islands because we can use the harder parts (of the trunk) for flooring and these secondary products as a growing medium so it is not wasted."

MARKET OPPORTUNITIES

Not only are there eager European buyers for flooring, but in Australia there is growing demand for high-density veneer for use in plywood. This could be produced from senile coconut palms, instead of traditional forest timbers. That means natural habitats, along with agriculture, would benefit from cocowood processing.

Senile palms can be transformed into valuable timber.

Local cocowood markets have also been identified and the wood's reincarnation as a building material in the Pacific not only reduces pressure on local forests and reliance on timber imports, but also brings other environmental and social benefits. As a direct result of the project several small landholders in Fiji and Samoa have been able to sell senile, non-productive palms, generating income. And employment and skills training was generated through harvesting, transport and processing.

"We can prove that there is good money to be made from old coconut palms," Dr Bailleres says. "There is the high-value wood products and the mulch by-product, so there is a range of possibilities and a range of businesses that can be profitable."

A cocowood industry would not affect the production of other coconut products, he says, because for cocowood to have the right profile as a timber it needs to be at least 60 years old. While that puts a fast-replenishing cocowood resource out of the question, ACIAR project partners in Fiji and Samoa estimate there are up to five million non-productive, senile palms in plantations.

In Fiji, where about 80% of the coconut palm resource is owned by communities or small land-holdings, the researchers note supply issues may be compounded by land tenure complications. In Samoa this appears less of an issue, although a key impediment remains the lack of infrastructure for high-quality processing.

"The time is ripe for an entrepreneur to come in and develop a commercial processing industry utilising the senile palms," says Dr Bailleres, who has a cocowood floor in his Brisbane office. "There are many options and opportunities. In fact, some of our project partners are already taking advantage of the outcomes of the project to start processing coconut palms for the European market." ■

FISH PONDS YIELD NEW FOOD ENTERPRISES

Communal harvesting in Nong Sod village pond, Thongvane village, Paksan district, Borikhamxay province.

An innovative village-based aquaculture program in land-locked Laos is lifting food supplies and incomes

BY BRAD COLLIS

Laos has two seasons—dry and wet. And with the vast volume of water that accumulates during the wet season in ponds, storages and floodplain depressions comes an important source of native fish to supplement villagers' food supplies.

These wild fish stocks are a crucial source of nutrition, but they soon run out. As part of efforts by the Government of Lao PDR to bridge this age-old supply–demand gap, the Culture-Based Fisheries (CBF) project was conceived.

In just over 2 years this ACIAR-funded project has turned an ad hoc seasonal food source into a structured, community-based aquaculture program that is not only strengthening food security but establishing new village economies.

The growing popularity of the program, rapidly spreading out from the initial project villages, is lifting the productivity of this natural food resource to the point where it is generating significant new income streams for communities with access to small bodies of water.

It is an important development because fish is the main animal protein source in Laos. Traditionally, the country has met its fish needs with wild harvest from the Mekong River and a limited supply from other, usually seasonal, water bodies.

Aquaculture is a comparatively new option, but project leader Professor Sena De Silva, from Deakin University in Melbourne, says indications are that CBF aquaculture is going to be adopted by many communities once people have seen the economic and social benefits generated almost immediately by the initial 11 project communities.

Professor De Silva, who is also director-general of the Network of Aquaculture Centres in Asia–Pacific (NACA), says the communities who participated in the CBF project—traditional farming communities with access to water bodies—have gained financially and socially through new income sources and spin-off community developments. "For example, in Thong Van Village in the Paksan District, after depositing funds to buy new seed stock, proceeds from fish harvests were used to upgrade the village temple. Future profits have been earmarked to upgrade the village school.

"In another community, in addition to sharing the profits, a proportion was used for community benefits, such as the purchase of hand tractors and repairing the village electricity transformer."

The essence of Culture-Based Fisheries is the utilisation of small water bodies for the secondary purpose of increasing fish production by supplementing natural fish populations with indigenous 'seed stock'. Essentially, it is an enhanced aquaculture activity in communal water bodies used primarily for irrigating downstream rice paddies.

Professor De Silva says the type of water body most suited to CBF is typically 3–15 hectares in area.

ACIAR's support brought in the technical knowledge needed to develop production models able to maximise the opportunity provided by these small, but numerous, water bodies.

Lessons learned in the development of CBF activities in Sri Lanka and Vietnam were applied and backed up by the Lao Government's provision of ongoing training and extension activities.

In particular, the knowledge gained from earlier CBF aquaculture in Sri Lanka and Vietnam gave researchers a head start in testing for the most productive and appropriate species combinations (such as *Labeo chrysophekadion* and *Cirrhinus molitorella*), the stocking densities needed, and other scientific inputs such as fry-to-fingerling nursing and rearing.

Subsequent government support has included training villagers in fry-to-fingerling rearing in nursery ponds to ensure that when stock is released they have grown large enough to minimise losses (primarily to predators).

COMMUNITY STRUCTURE

Professor De Silva says one of the reasons why the CBF concept has gained rapid acceptance in Laos is the well-organised communal structure of village communities. Water bodies are managed by the community with government support, particularly from the Department of Livestock and Fisheries (DLF) within the Ministry of Agriculture and Forestry.

Researchers were able to work with village representatives already responsible for managing local water sources and develop management plans based on the characteristics of each water body. These management plans have been part of a transition towards governance mechanisms under which the new fisheries resources are co-managed with the DLF.

As part of this program, the Lao Government has developed a National Strategy for Fisheries to 2020, placing fisheries into the national objective to alleviate poverty through higher—and more commercial—productivity from agriculture, fisheries and forestry.

A regulatory framework is being developed to make CBF activities legally recognised entities in Laos, to support the fisheries' commercial development by village communities.

Professor De Silva says two contrasting revenue-sharing practices have emerged so far. The first model is based on seed stock being

Fisheries in Lao PDR

ACIAR's program manager for fisheries Dr Chris Barlow says community-based fisheries are just one arm of ACIAR's fisheries activities in Lao PDR, given the importance of fish in the national diet.

"Fish comprise about 50% of the animal protein consumed by Lao people, so in both nutritional and livelihood terms the resource is very important," he says.

Dr Barlow says ACIAR's partnership with the Lao Government in fisheries research is aimed at enhancing productivity of both aquaculture and wild fisheries.

"The CBF work is effectively a mix of aquaculture and natural fisheries management, using aquaculture technologies to improve fisheries production in community-managed reservoirs," he says.

"The major thrust of our work in Laos is building fish-passage technology to facilitate movement of migratory fish past the numerous barriers (weirs, flood gates and the like), which have been built on flood plains. These 'fish ways' will allow migratory species to reach new flood plain habitats, including small community-managed reservoirs. Availability of floodplain or seasonally inundated habitat is the major driver of fisheries productivity in the Mekong."

PHOTOS: NETWORK OF AQUACULTURE CENTRES IN ASIA-PACIFIC

Harvesting in the conventionally managed Nong Nok lake, Sivilay village, Vientiane province, takes place daily for three to six weeks.

PARTNER COUNTRIES

Lao PDR, Thailand

PROJECT: FIS/2005/078: Culture-based fisheries development in Lao PDR

CONTACT: Professor Sena De Silva, sena@deakin.edu.au

Community engagement in harvesting, Thong Van village.

Harvesting can be a family activity in water bodies with stage 2 management.

Regular community dialogue is a key to success of CBF activities in rural Laos.

PHOTOS: NETWORK OF AQUACULTURE CENTRES IN ASIA-PACIFIC

nurtured and protected from unauthorised fishing or poaching, and the water bodies maintained to prevent fish escaping. When the fish reach marketable size they are harvested. All households take an equal share of fish for consumption, but the revenue from fish sold is shared in proportion to people's input contribution.

One example of this model is Sivilay village, which has local responsibility for a small lake. In 2008–09 it doubled fish production from the lake and sold 7.5 tonnes of fish to vendors, earning the village US$8,738—more than four times the average Lao village gross domestic product (GDP). Of this revenue, 15% was banked, 45% used for inputs and improved community amenities, and the balance distributed.

The Sivilay communal management committee was expecting to further double production in 2009–10, invest in a weir in which to maintain its own broodstock and eventually become a seed-stock supplier to surrounding communities.

Under the second model that has emerged, the community manages the stock, harvest and revenue in three stages:

1 After a period of growth by the stocked fish, community members are allowed to fish for household consumption using only hook and line from the shore.

2 At stage 2, small scoop nets are allowed, from shore, and for household consumption only.

3 The third stage covers the main harvesting season, during which community members buy a licence to fish, with the cost of the licence determined by the type of fishing gear to be used (for example, large net or hand-held scoop net). All fish caught are the property of the licence holder who can consume or sell the fish as they wish. Stage 3 continues until the water level recedes and most of the stock has been harvested.

Professor De Silva says these contrasting revenue-sharing practices are determined by community needs. For example, some communities might put the food resource ahead of profit or income motives.

The Lao project is now attracting interest further down the Mekong in Cambodia, where fisheries authorities have requested assistance to develop similar culture-based fisheries.

ACIAR is now looking to fund a symposium in 2011 to review what has been learnt from all the community-based fisheries projects in the region. The hope is to identify future needs and maximise the impact of CBF activities in the whole of the Mekong region. ■

GENETIC RESOURCES PUT TO WORK FOR FARMERS

Three countries have exchanged brassica oilseed breeding material, including canola, in a collaboration that sets a valuable precedent for research cooperation and the sharing of Chinese and Indian plant genetic resources

BY GIO BRAIDOTTI

PHOTO: PAUL JONES

PARTNER COUNTRIES
India, China

PROJECT: CIM/1999/072: Oilseed Brassica improvement in China, India and Australia

CONTACT: Phil Salisbury, phil.salisbury@dpi.vic.gov.au

Associate Professor Phil Salisbury.

Farmers in India, China and Australia are among the beneficiaries of a research collaboration in which genetically rich germplasm collections have been exchanged between the three countries.

The ACIAR-sponsored collaboration enabled unprecedented interchange among Australia, India and China, giving breeders, farmers and the oilseed industries access to a larger gene pool from which to select for advanced traits. For Australian growers that means the potential for greater tolerance to heat, drought and major diseases.

The project ran for 5 years, culminating recently in the final exchange of breeding populations. These lines are now in the final evaluation and bulking stage before they are handed over, with no strings attached, to breeding programs responsible for developing more resilient, better-performing oilseed varieties for farmers.

The exchange also had the support of Australia's Grains Research and Development Corporation (GRDC) and involved 13 research organisations. The project was led by Associate Professor Phil Salisbury of the University of Melbourne and the Victorian Department of Primary Industries (DPI).

MUTUAL BENEFITS

Associate Professor Salisbury says that historically China and India have been reluctant to allow access to their genetic resources. "It took a lot of negotiating to set up the exchange and it only happened when each partner could see mutual benefits," he says.

"So the level of exchange we got was a real first. Ultimately, it has been very successful, not only in exchanging germplasm but also working on screening techniques and ways to test for diseases such as sclerotinia rot, which is particularly difficult to detect."

The researchers focused on germplasm from two brassica species—*Brassica napus* (the main species used in Australia for canola production) and *B. juncea* (an oilseed species developed for its greater drought tolerance).

The traits of greatest interest to each country were identified at the project's outset. Researchers then selected lines from national collections to exchange in the first and third year of the project.

Additionally, breeders selected and enhanced the traits of greatest interest to each of the partner countries. These traits included resistance to diseases such as sclerotinia rot, white rust and blackleg, quality traits such as reduced levels of erucic acid and glucosinolates, and drought tolerance.

"China's sclerotinia tolerance is probably the best tolerance anywhere in the world," Associate Professor Salisbury says. "India and Australia stand to benefit from greater levels of drought tolerance in Indian juncea. In terms of Australian germplasm, our partners were most interested in quality traits."

Associate Professor Salisbury explains that India and, to a lesser extent, China do not necessarily produce canola-quality oil. It was Canadian, European and Australian breeders who undertook the breeding that converted rapeseed into the higher-quality canola plants that produce healthier oil and meal.

"The ACIAR/GRDC project transferred quality traits into lines adapted to production in the recipient countries," he says. "In return, the Australian industry has gained access to breeding lines that are more stress tolerant and resistant to diseases."

ENDURING RELATIONSHIPS

Despite the ACIAR/GRDC project ending, Associate Professor Salisbury believes that relationships forged among research organisations in the three countries will endure into the future. For Australian researchers that means ongoing collaborations with Indian and Chinese scientists, especially cytologists such as Dr Surinder Banga, an expert at making interspecific crosses that allow the movement of valuable traits from wild species into cultivated oilseed varieties.

"The cytological skills of Indian scientists are remarkable," Associate Professor Salisbury says. "And the brassica family is large and incredibly diverse, with many wild species expressing traits of interest. So we would certainly look to try and continue working with Dr Banga. But overall there are many potential areas for collaborations in both China and India in the future." ■

From little things big things grow

Communities in Solomon Islands and Papua New Guinea are getting a taste for nutrient-rich crops that offer positive health benefits

BY MANDY GYLES

Solomon Islands farmer Samson Sonia and his family are reaping the rewards from a bountiful harvest of the orange-fleshed sweetpotato (OFSP) variety, Beauregard. Not only is this variety putting money in their pockets, it is also helping boost the vitamin A levels of those who are eating it.

Samson and his wife Janet are now growing about 300 mounds of Beauregard. They chose the variety because it provides good cash returns, matures in only 3 months and because they learnt about its nutritional quality.

A survey conducted as part of an ACIAR-funded project identified Beauregard as one of seven sweetpotato varieties with high levels of beta-carotene (a compound that can be converted into vitamin A in the body) and favourable agronomic traits. The variety—imported from the International Potato Center (CIP) in Peru—is by far the most popular sweetpotato in Australia.

While Beauregard has 250–350 milligrams per kilogram of beta-carotene (dry weight basis), the survey also identified seven local OFSPs as having more than 200 mg/kg. The expectation is that these high levels of beta-carotene will help people overcome the vitamin A deficiencies that are prevalent in Solomon Islands and Papua New Guinea.

Scientific research in the Pacific and Africa has shown that boosting the quantity of beta-carotene in the diet reduces vitamin A deficiency and the prevalence of blindness, infectious diseases and malaria, especially in children.

BUILDING DEMAND

Crop scientist Pita Tikai, who recently visited Samson on the northern Guadalcanal plains, reports that Samson has sold two harvests of Beauregard at the Honiara market. "His wife Janet noticed the high demand for the crop after they sold their first harvest, so they decided to plant a lot more," Pita says.

"They started with just two roots from a Farmer Field School at Binu conducted by CIP. They grew the two roots on the mounds and took cuttings, which they used to plant another five mounds. They harvested the five mounds and consumed them but decided to multiply the materials into 12 mounds and then to 32 mounds.

"When Samson and Janet Sonia sold the harvested roots at Honiara market, they found there was good demand for the crop. So they grew another plot of 73 mounds, and it has grown from there," says Pita, who recently joined Samson and his wife during a harvest for which they received SBD$300 (about A$40) from two buyers, including local restaurant owner Julieth Keti. She wants a regular supply of the variety and is willing to pay a premium for them.

"The customers liked the Beauregard variety because of the quality, the uniform size, and because it is quite different from other sweetpotato," Samson says. "Secondly, mothers in Honiara are saying that the crop is very good for feeding their babies who are being weaned."

Other farmers have been asking Samson for the planting materials since they saw the roots he sold at market during his first harvest. Pita Tikai says a number of farmers on the Guadalcanal Plain like Samson are growing more than 100 mounds of the Beauregard sweetpotato.

SCREENING VARIETIES

The University of Adelaide's Dr Graham Lyons, who led the ACIAR-supported project, is very pleased that the OFSP program seems to have "acquired a life of its own" beyond the ACIAR project.

"This really is an inspiring story, of how Samson and his wife, from a humble start with a small amount of planting material from the ACIAR/CIP Farmer Field School, are now becoming a solid commercial supplier to the Honiara market of an OFSP we introduced that is apparently now more popular than any of the traditional white ones," Dr Lyons says.

"When we started the project three years ago we found Solomon Island villagers grew a small amount of orange-fleshed sweetpotato because they liked the colour and flavour, but they had no idea it delivered such important health benefits."

The ACIAR research project screened 77 orange and yellow-fleshed sweetpotato varieties, finding that 18 local varieties exceeded 100 mg/kg beta-carotene, with seven of these producing over 200 mg/kg, an excellent level. Dr Lyons explains it takes just 100 grams (fresh weight) a day of these sweetpotato varieties to satisfy a child's vitamin A needs.

"The most suitable Solomon Islands OFSP varieties identified in the survey—with high beta-carotene, high yield, pest resistance, acceptable flavour and texture—were propagated and distributed through the local agricultural development organisation, the Kastom Gaden Association," Dr Lyons says.

"Several varieties were imported from CIP, Peru, with two varieties—including Beauregard—showing outstanding yield and size of storage roots, even under wet conditions, as often experienced on the Guadalcanal and Makira weathercoasts."

GROWING AWARENESS

Dr Lyons is keen to help improve the nutrition and health of people in Solomon Islands and Papua New Guinea, particularly infants and children, by boosting their vitamin A status through increasing their consumption of foods high in beta-carotene.

He believes Pacific islanders' diets have become overly dependent on heavily processed imported food at the expense of local fruit, vegetables and fish, causing an epidemic of diabetes, chronic heart disease and malnourishment.

The ACIAR project included an awareness program extended to include other local nutritious foods, including bananas, paw paw, legumes and other green leafy vegetables. A 'Go Local' program that promoted these foods received extensive media coverage.

Two local food promotional posters in English and pidgin featured high-carotenoid bananas from Makira Island and OFSPs, leafy vegetables and nutrient-rich local foods of Solomon Islands. About 2,100 people attended 28 nutrition workshops and talks in Solomon Islands and around Lae, in PNG's Morobe Province.

The food posters, community plantings and nutrition workshops hosted by Dr Lyons and renowned nutritionist Dr Lois Englberger and anthropologist Dr Wendy Foley helped get the message across. Many villagers in parts of Solomon Islands and PNG are now growing more colourful vegetables and fruits, including OFSPs, pawpaw and yellow 'toraka' bananas.

Dr Lyons says there is anecdotal evidence that malaria and night blindness have declined in the areas of Solomon Islands and PNG where the work has been underway.

Much of the success of the project is due to the fact Dr Lyons worked with villagers at a grassroots level. Funding them directly to promote the project outcomes reaped the maximum benefits.

"ACIAR is very happy with the results we have achieved," Dr Lyons says. "For a small project—$140,000 in total—the health and cultural benefits to Solomon Islands and PNG have been outstanding."

The ACIAR project was jointly funded by Washington-based HarvestPlus, which seeks to reduce hidden hunger and provide micronutrients to billions of people directly through the staple foods they eat. Other collaborators included the Secretariat of the Pacific Community, Solomon Islands Ministry of Agriculture and Livestock, Island Food Community of Pohnpei, PNG National Agricultural Research Institute, PNG Women in Agriculture Development, Queensland Primary Industries and Fisheries, Makira Ulawa and Malaita provinces and community groups. ■

Vitamin A deficiency

Vitamin A plays an important role in vision, bone growth, reproduction and the regulation of the immune system. Vitamin A deficiency affects up to 400 million people around the world, including 150 million children. It often occurs in conjunction with protein, iron and zinc deficiencies and manifests in blindness, impaired bone growth, and susceptibility to malaria, HIV/AIDS, tuberculosis, influenza, pneumonia and measles. Just 100 grams of orange-fleshed sweetpotato a day can provide sufficient levels of vitamin A to prevent deficiencies. Recent research by the University of Adelaide has shown that improving the vitamin A status of young children in deficient populations leads to a 23% reduction in child mortality.

Northern Guadalcanal farmer Samson Sonia with his harvest of beta-carotene-rich Beauregard sweetpotato variety.

PHOTO: PITA TIKAI

PARTNER COUNTRIES

Solomon Islands, Papua New Guinea

PROJECT: PC/2006/106: Screening and field trials of high-carotenoid sweetpotatoes in Solomon Islands and Papua New Guinea to improve human vitamin A status

CONTACT: Dr Graham Lyons, graham.lyons@adelaide.edu.au

FAREWELL TO THE 'GREEN BANK' ADVOCATE

ACIAR's outgoing forestry research manager Dr Russell Haines discusses the role his forestry program has played in improving the lives of smallholders and the capacity of partner countries

BY MANDY GYLES

ACIAR recently farewelled forestry research manager Dr Russell Haines after nearly 6 years of service. During that time, Dr Haines created a forestry research program that sought to bring economic return to smallholder farmers. The sustainability of those gains was another key concern, with Dr Haines strategically investing to build the forestry management capacity of developing countries. In the process, he was instrumental in bringing 34 forestry specialists to Australia to take part in postgraduate studies … an achievement that will forever remain a source of pride.

How do you think ACIAR can contribute to the development of forestry industries?

What I think has great potential in our partner countries is smallholder forestry—particularly agroforestry, where people grow a small plot of trees mixed in with agricultural crops. This is not an unusual practice. In places like Papua New Guinea (PNG) or the Pacific, people have been practising agroforestry for hundreds of years at least.

In PNG, people are quite happy to grow betel nut, pandanus and sago with their other crops and are adept at managing these agricultural systems. There is a lot of potential for building on that, integrating some of the high-value timber trees such as teak or mahogany.

This amounts to a smallholder agroforestry business, where people grow a small number of trees to use as a 'green bank'—a low-maintenance crop with a high return on labour.

How much of a challenge are long-growing trees for smallholders?

It is a challenge but there are mitigating factors. One is that growth rates for these trees are faster than in Australia—you can grow a reasonable size teak tree in Solomon Islands, PNG or Laos in about 15 years.

If you use an agroforestry approach then smallholders are not waiting all that time until they get a return from their land. When the trees are eventually harvested they provide an injection of cash. So once again, it is the concept of a 'green bank'—farmers make small deposits along the way in terms of looking after the trees and harvest when they need money.

There are also land-tenure considerations. Large plantation estate such as we have in Australia, with trees planted over several thousand hectares of land, is a scenario fraught with risks in our partner countries, where it is not as easy to acquire rights to a large land area for an extended period of time. There is, however, a generally accepted principle that if you plant a tree, you own it. So integrating trees into customary agricultural systems avoids land tenure issues, since people own the trees just as they own their coffee plants.

In what way have ACIAR activities enhanced people's lives?

I am a great advocate of teak and have worked with it in a number of countries. I think it is a species of great promise: high value, low maintenance and it grows well.

We started some work looking at improving silviculture in northern Laos where there are about 15,000 hectares around Luang Prabang of smallholder teak holdings. What we are doing is setting up experimental plots and demonstration sites to showcase the impact of spacing and thinning on both tree size and log quality. So the project is making management practices available to smallholders to help them get more volume per hectare of quality trees.

The project attracted interest from third parties, such as the Tropical Forest Trust, who are now helping farmers to get certification for their teak plantings and to market in Europe. As a result, the price smallholders are getting for their teak has already doubled.

We are also working in Laos on a timber-processing project to improve the efficiency of processing and manufacturing. Some of the timber factories and commercial organisations with whom we are working have already improved their procedures. The intention is to improve timber value across the whole value chain of the final product, which will feed back benefits to the people who are growing the wood.

What have the outcomes been in PNG?

We took a similar approach, where we are trying to promote tree planting by communities. On a recent visit, I was encouraged by the enthusiasm of the people involved in our project at the grassroots level. It is quite heartening to see and I am confident that they will do well out of that activity.

The work on canarium—the galip nut of PNG—is going well. We are working on ways to process (crack and dry) the nut. Even though that project has only been going two years, we have encouraging results. The Australian group on that project has a lot of experience in the macadamia industry and they have adapted a macadamia nutcracker for use with the galip nut, which has attracted a lot of interest. The European Union is now setting up a pilot plant at Keravat in East New Britain to process nuts using the technologies developed in the ACIAR project. I expect this development to lead to a much larger industry.

Additionally, the cocoa pod borer, which has had a dramatic impact on the coca industry of East New Britain, has obliged people to use a more intense management system. As a result the area managed for cocoa will decline, so people will be looking for other crops to plant. Canarium is a very good option for them. But to build a large industry, people need to grow the best varieties and ensure sufficient nut supplies.

How important is canarium in these Pacific communities?

Canarium is an important traditional crop in PNG (where it is known as galip nut), Solomon Islands (ngali) and Vanuatu (nangai). People have harvested nuts from the naturally grown trees for hundreds of years. It is a highly prized traditional food with a nice flavour and texture. With appropriate development it could be up there with the macadamia.

However, it has a delicate kernel, which is why we had to pay attention to how it is processed. We also have in mind some product-development work, somewhat analogous to the macadamia industry which markets, for example, chocolate-covered nuts. Plus the tree grows quite large and is also used for timber.

Russell Haines and farmer Phillip Bepi inspect fuelwood-agroforestry planting near Mt Hagen, PNG.

PHOTO: EMILY FLOWERS

To help build capacity in partner countries, every year Australia hosts a number of forestry students in postgraduate studies. How important is that activity to you?

I think the John Allwright Fellowship program for postgraduate study in Australia is one of the most effective things ACIAR does in terms of long-term impacts for both the partner country and Australia.

The people who come here to study—apart from getting more technical qualifications and skills—also develop networks and friendships that last a lifetime. Since many Fellows go on to hold senior positions in their own countries, they carry over a favourable opinion of Australia. One example is Michael Poisi, who studied at the Australian National University and who now holds an influential position as a forestry manager with the PNG Sustainable Development Program.

At ACIAR, an important part of my job was to identify people who are practically qualified and interested in studying in Australia. I always built that opportunity into my projects and then helped people with applications to study in Australia. In my forestry program between 2005 and 2010 there were 34 John Allwright Fellows. I'm very proud of that record and view it as one of the better things I've done at ACIAR.

Is there any particular ACIAR project whose impacts for Australia stand out?

The sandalwood project is an interesting example. There are now about 3,000 hectares of sandalwood planted in Western Australia and the silviculture approaches used on those plantations were largely developed in the ACIAR project. There was an evaluation done on the present value of those plantations: $766 million.

More broadly, in recent years Australia has established a hardwood plantation industry, whereas 20 years ago Australia's plantation forestry was basically pines. Australia's traditional research expertise was in pines and it is the ACIAR projects that led the way over the years in getting people involved in hardwood such as blue gum. Now teak is becoming of great interest in northern Australia. It is a wonderful species and there are several companies that are interested in what ACIAR is doing. So we are making a contribution to domestic forest industries. ■

Ministerial changes

Kevin Rudd MP is Australia's new Minister for Foreign Affairs. Since undertaking the role, Minister Rudd attended the UN Summit on the Millennium Development Goals (MDGs), and has initiated a review of the effectiveness of Australia's aid and development program.

Richard Marles MP is the new Parliamentary Secretary for Pacific Island Affairs, replacing recently retired Duncan Kerr. Mr Marles visited Pacific Island countries in October and December 2010.

Stephen Smith MP, the former Minister for Foreign Affairs, is now Australia's Defence Minister. Mr Smith visited ACIAR on 13 September 2010 to farewell the agency.

Bob McMullan, the former Parliamentary Secretary for International Development Assistance, retired from politics, and has been appointed by the Government as a special envoy to Africa.

Foreign Affairs Minister Kevin Rudd meets UN Secretary-General Ban Ki-moon in New York.

Emergency effort for Pakistan

A group of smallholder dairy farmers in flood-affected Pakistan have received desperately needed feed, seed and veterinary products to help keep their animals alive.

The $30,000 relief initiative for eight villages in the Bhakkar district was organised by Australian and Pakistani staff of an ACIAR project being led by Charles Sturt University.

The dairy farmers have been the focus of a project to help increase milk production through improved extension methods since 2007. The farmers were anxious to access feed and veterinary supplies to keep their remaining animals alive after the flooding and to secure their future milk supply and incomes. Good-quality fodder seed suitable for planting in these areas was also supplied to the affected villages to help secure future feed supplies.

Staff of the University of Veterinary and Animal Sciences, Lahore, and the Pakistan Dairy Development Company have been visiting the villages and coordinating the delivery of supplies.

ACIAR project partner Dr Russell Bush, of the University of Sydney, assisting with the feed relief effort in Bhakkar, Pakistan.

By mid-September, the Australian Government had contributed $75 million in aid to Pakistan and a medical taskforce to support the UN and Pakistani Government's flood response.

World Bank discussion on food security

ACIAR CEO Dr Nick Austin was one of three speakers in a panel discussion on food security with ActionAid Australia CEO Archie Law and Crawford Fund executive director Denis Blight on 22 July 2010. The discussion, moderated by Olivia Rousset, was part of the World Bank Praxis series run in partnership with Australian public affairs channel A-Pac.

Crawford Fund conference

The 2010 Crawford Fund conference was themed 'Biodiversity and World Food Security: Nourishing the Planet and its People'. Speakers highlighted the value and vulnerability of biodiversity in agriculture, and addressed the additional pressures that climate change impacts will bring to bear on both the conservation

and use of biodiversity. Professor Hugh Possingham, director of the Ecology Centre at the University of Queensland, gave a thought-provoking address entitled 'Can We Have Our Biodiversity and Eat It Too'. Notable international speakers were Dr Christian Samper, director of the National Museum of Natural History, Smithsonian Institution, Professor Stephen D. Hopper, director the Royal Botanic Gardens, Kew, and Dr Emile Frison, director-general, Bioversity International. Presentations and conference proceedings are available at the Crawford Fund website (www.crawfordfund.org).

New Crawford Fund chair

The Hon. John Kerin AM has been appointed as the chair of the Crawford Fund, succeeding the Hon. Neil Andrew AO who has retired after two terms as chairman. Mr Kerin, who has been actively involved in the Crawford Fund, is an economist who served as Minister in portfolios including Primary Industries and Trade and Overseas Development.

The Hon. John Kerin AM and the Hon. Neil Andrew.

PHOTO: STUART HAY, ANU PHOTOGRAPHY

Dr Christian Samper speaks at the Crawford Fund conference at Parliament House.

ACIAR website redesign

ACIAR has relaunched its website with a new visual design and information architecture. As a result of feedback, a powerful new search technique enables information to be found quickly. The design reflects changes in the way ACIAR works as it moves to larger programs and new strategic partnerships. The architecture also responds to the Australian Government's move to engage with the community and deliver better services to using Web 2.0 technologies.

PHOTO: ABC

ABC *Landline* cameraman Chris Lockyer filming aquaculture farms on scenic Ha Long Bay, northern Vietnam.

Landline visits Vietnam

ABC's *Landline* reporter Kerry Staight visited Vietnam to report on several ACIAR initiatives in July 2010. Features were produced on the development of the oyster industry, the use of beer-based fruit-fly bait and the hatchery production of sea cucumbers. The programs can be viewed online at www.abc.net.au/landline/

Graduates

KUD SITANGO

Mr Kud Sitango returned to Papua New Guinea in September 2010 after studying for his Masters degree at the University of Tasmania. A research officer with the PNG National Agricultural Research Institute, Kud has been working on the improvement of PNG's pyrethrum crop.

An ACIAR-funded project has been helping to recommercialise PNG's pyrethrum industry, with the assistance of Tasmanian company Botanical Resources Australia.

For his Masters degree, Kud investigated the factors influencing the yields and qualities of pyrethrum under Tasmanian climatic conditions.

He plans to continue improving PNG's pyrethrum crop through screening and selecting for high flower yield and seed qualities, improved storing and drying methods, cropping practices and disease control. "I also want to provide more training to farmers and extension officers on improved production practices," he said.

An all-year-round crop in PNG's fertile high altitudes, pyrethrum is providing the farmers with good yields and fortnightly harvests. "Women farmers find it easy to grow and manage, and it provides them with a regular cash income only a short period after planting, which is a great benefit to them and their children," Mr Sitango said.

Kud Sitango was a recipient of an ACIAR John Allwright Fellowship. John Allwright made an outstanding contribution to Australian and international agricultural research. His family was a pioneer in the production of pharmaceutical opium.

VIENGXAY PHOTAKOUN

Mr Viengxay Photakoun recently completed a Masters degree at Charles Sturt University (CSU) with support from the ACIAR John Allwright Fellowship program. He returned to Laos to continue his work on building the capacity of agricultural extension officers to benefit livestock producers.

Prior to coming to Australia, Viengxay worked on an ACIAR-funded project introducing fodder crops for livestock production in the uplands of Lao PDR. He worked closely with Dr Joanne Millar, who has a special interest in developing successful extension methods.

Mr Photakoun completed his Masters with Dr Millar at CSU's School of Environmental Sciences, near Albury. Viengxay's Masters degree investigated ways to build institutional capacity to implement participatory research and extension in Laos. He is now working for the National Agriculture and Forestry Extension Service (NAFES), responsible for extension services for livestock and fisheries.

PHOTO: MANDY GILES

Lao Masters graduate Viengxay Photakoun with his supervisor Dr Joanne Millar, of Charles Sturt University.

ACIAR John Allwright Fellows Ghani Akbar (Pakistan), Sudhir Yadav (India), Eduardo Serrâo (East Timor) and Salend Kumar (Fiji).

Kud Sitango inspecting a pyrethrum trial site in Richmond, Tasmania.

PHOTO: BOTANICAL RESOURCES AUSTRALIA

Scholarships

A group of 25 Masters and PhD students, being supported by ACIAR's John Allwright Fellowship program, spent a week in Canberra in October 2010.

The students, including nine women, came from a wide range of countries in the Asia–Pacific region. Notable was the group of four postgraduate students from the small nation of East Timor, which has a great need for capacity building in agricultural research.

NEW STAFF

Tony Bartlett Forestry Research Program Manager
Tony replaced Dr Russell Haines in July 2010. He was previously responsible for natural resource management programs and policy at the Department of Agriculture, Fisheries and Forestry. In this role, Tony represented Australia in many international forest policy meetings and managed, developed and implemented the Asia–Pacific Forestry Skills and Capacity Building Program. Tony has served as director of ACT Forests and manager of Forest Policy in the Victorian Forests Service, and spent two years in Nepal and Vanuatu on forestry aid projects. He was recognised for his contribution to Australian and international forestry with a Centenary Medal in 2003. He holds a Bachelor of Forestry Science (Honours), a Master of Science from Oxford and a Graduate Diploma in Business Management.

Frances Barns Indonesia Country Manager
Frances, who replaced outgoing Julien De Meyer in September 2010, has spent 10 years managing and delivering aid programs and projects in Indonesia and East Timor. As manager of AusAID's rural development portfolio in East Timor, Frances was associated with the AusAID–ACIAR Seeds of Life 2 project. She has a Bachelor of Asian Studies and is fluent in Bahasa Indonesia.

Albert Blair Chief Financial Officer
Albert replaced Paul Tyrrell in June 2010. He has more than 20 years' experience in all facets of finance and accounting. Albert most recently worked with an Australian Government statutory authority and has extensive experience in the aid-funded sector, including with the Pacific Islands Forum Secretariat, Fiji, the Northern Land Council, Darwin, and with PricewaterhouseCoopers in PNG and the United Kingdom. Albert holds a Masters of Commercial Law, a Postgraduate Diploma in Advanced Financial Accounting and a BSc (Economics and Accounting).

Rebecca Bogosia Papua New Guinea Assistant Manager
Rebecca has joined ACIAR in Port Moresby. She previously worked at the Australian High Commission in Port Moresby managing accounts and travel arrangements. Rebecca holds a Bachelor of Science in Tropical Agriculture from the University of Natural Resources and Environment (formerly Vudal), PNG, and a Certificate in Accounting.

NEW APPOINTMENTS

Lisa Wright Director, Corporate
Lisa has stepped up to the new role of Corporate Director, having previously been ACIAR's Governance and Communications Manager. Lisa manages the provision of all corporate services including human resources, financial management, governance and communications, information management, security, infrastructure and information technology services.

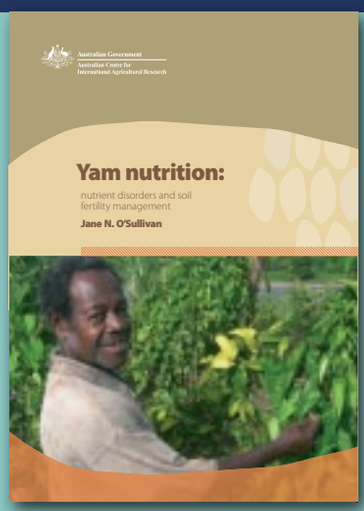
Sharyn Turner Human Resources Manager
Sharyn has been working with ACIAR as HR manager since mid-2009 and recently became a permanent staff member. An HR generalist, Sharyn has a diverse background of skills and experience with previous HR roles at the Australian Crime Commission, CSIRO and Engineers Australia. Sharyn holds a Bachelor of Arts with a double major in psychology and management and a Certificate IV in Training and Assessment.

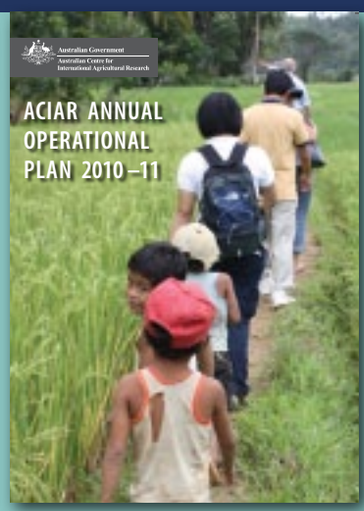
Warren Page Manager Communications and Public Affairs
Warren recently took on this dedicated communications role at ACIAR. He has worked with the agency since 2001 in a number of positions within the communications team, including as information manager and science writer. Warren has made significant contributions to the strategic planning of ACIAR's corporate communications portfolio and in the production of publications such as *Partners* magazine and ACIAR annual reports.

Mandy Gyles Public Affairs Officer
Mandy is responsible for ACIAR's media relations and public awareness activities. She has extensive experience as a communicator in agricultural research organisations, and has also worked as an ABC Rural reporter and on an ACIAR-funded project in Tonga the 1980s. She holds a Bachelor of Agricultural Science and a Masters of Rural Science.

Catherine Wei Accountant
Catherine has been working with ACIAR as assistant accountant since July 2009 and recently became a permanent employee. Catherine holds a Bachelor of Business (Accounting) and has commenced her CPA Program.

Emily Flowers Papua New Guinea Country Manager.
Prior to becoming ACIAR's PNG country manager, Emily spent five years in a variety of roles at ACIAR, including communications officer managing the ACIAR website. Emily has a Bachelor of Science (Hons) in resource and environmental management from the Australian National University.





NEW PUBLICATIONS

CORPORATE PUBLICATIONS

ACIAR Annual Report 2009-10 ACIAR's performance including a review of project activities by partner country and the centre's financial statements, AR 2009-10, 211pp.

Adoption of ACIAR project outputs: studies of projects completed in 2005-06 David Pearce and Debbie Templeton (eds), CP 43, 68pp. $43 (plus postage and handling)

ACIAR Corporate brochure CP 42, 8pp.

ACIAR publications catalogue 2010 An indexed catalogue of ACIAR publications up to the end of June 2010, CP 41, 123pp.

ACIAR Annual Operational Plan 2010-11 ACIAR's planned research and development priorities, corporate expenditures and key performance indicators for the year ahead, AOP 2010-11, 152pp. Online versions available in Bahasa Indonesia and Vietnamese.

TECHNICAL REPORTS

Environmental sustainability of oil palm cultivation in Papua New Guinea *Paul N. Nelson et al., TR 75, 66pp. $24 (plus postage and handling)*

Social capital and cattle marketing chains in Bali and Lombok, Indonesia *I. Patrick, G. Marshall, I. Ambarawati and M. Abdurrahman, TR 74, 78pp. $24 (plus postage and handling)*

Balsa: biology, production and economics in Papua New Guinea *Stephen Midgley, Michael Blyth, Neville Howcroft, Dao Midgley and Alan Brown, TR 73, 100pp. $25 (plus postage and handling)*

Beef palatability in the Republic of South Africa and the implications for niche-marketing strategies *J. Thompson, R. Polkinghorne, A. Gee, D. Motiang, P. Strydom, M. Mashau, J. Ng'ambi, R. deKock and H. Burrow, TR 72, 56pp. $15 (plus postage and handling)*

MONOGRAPHS

Yam nutrition: nutrient disorders and soil fertility management *Jane N. O'Sullivan, MN 144, 112pp. $42 (plus postage and handling)*

Insects of upland crops in Cambodia *C. Pol, S. Belfield and R. Martin, MN 143, 132pp. (online only)*

Forages and farmers: case studies from South-East Asia *John Connell, Werner Stür and Peter Horne, MN 142, 120pp. $35 (plus postage and handling)*

Weeds of upland crops in Cambodia [Khmer translation] *Robert Martin and Pol Chanthy, MN 141a, 86pp.*

A guide to upland cropping in Cambodia: maize [Khmer translation] *Stephanie Belfield and Christine Brown, MN 140a, 43pp.*

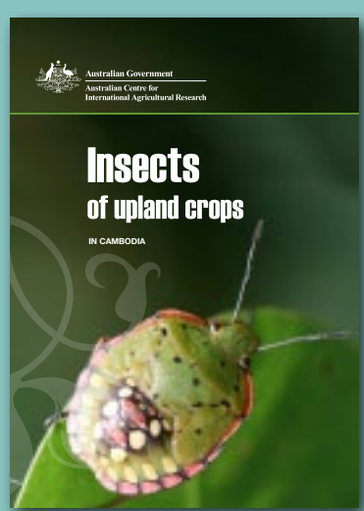
IMPACT ASSESSMENTS

Benefit–cost meta-analysis of investment in the international agricultural research centres *Anthea McClintock and Garry Griffith, IAS 68, 46pp. $35 (plus postage and handling)*

The biology, socioeconomics and management of the barramundi fishery in Papua New Guinea's Western Province *H. Fisher, IAS 67, 51pp. $37 (plus postage and handling)*

Extending low-cost fish farming in Thailand: an ACIAR-World Vision collaborative program *D.N. Harris, IAS 66, 72pp. $40 (plus postage and handling)*

ACIAR investment in research on forages in Indonesia: review and impact assessment *G. Martin, IAS 65, 60pp. $40 (plus postage and handling)*



FINAL REPORTS (AVAILABLE ONLINE ONLY)

AFRICA

Enhancing food security in eastern Africa *Daniel Rodriguez, Andries Potgieter, Alex Hoffman, Peter Davis, Solomon Fekybelu and Andrew Ward, Final Report for CSE/2009/043, www.aciar.gov.au/publication/FR2010-18*

ASIA

Development of conservation farming implements for two-wheel tractors (power tillers) in Cambodia, Lao PDR and Bangladesh *Ronald J. Esdaile, Richard Bell, Israil Hossain, Enamul Haque, Pao Sinath and Leigh Vial, Final Report for CSE/2007/027, www.aciar.gov.au/publication/FR2010-20*

Developing research options to mainstream climate adaptation into farming systems in Cambodia, Laos, Bangladesh and India *Christian Roth, Peter Brown, Don Gaydon, Neil MacLeod, Cam McDonald, Igbal Khan and V. Ratna Reddy, Final Report for LWR/2008/015, www.aciar.gov.au/publication/FR2010-19*

Strengthening regional mechanisms to maximise benefits to smallholder shrimp farmer groups adopting better management practices *C.V. Mohan, Richard Callinan, Arief Taslihan, Ravichandran, Sri Vishnu Bhat, N.R. Umesh, Malinee Witchawut and Vu Dzung Tien, Final Report for FIS/2006/144, www.aciar.gov.au/publication/FR2010-17*

Integrated soil and crop management for rehabilitation of vegetable production in the tsunami-affected areas of Nanggroe Aceh Darussalam province, Indonesia *Gregory C. Luther, Rachman Jaya, M. Ramlan et al, Final Report for SMCN/2005/075, www.aciar.gov.au/publication/FR2010-15*

Development of fish passage criteria for floodplain species of central Laos *Lee Baumgartner, Garry Thorncraft, Tim Marsden, Oudom Phonekhampeng, Douangkham Singhanouvong, Ivor Stuart and Ubolratana Suntornratana, Final Report for FIS/2007/076 and FIS/2006/183, www.aciar.gov.au/publication/FR2010-14*

Assessing the potential for low-cost formulated diets for mud crab aquaculture in Australia, Indonesia and Vietnam *N. Richardson, P. Maher, B. Paterson, Nguyen Co Thach and Ketut Suwirya, Final Report for FIS/2000/065, www.aciar.gov.au/publication/FR2010-13*

Mitigating the threat of banana *Fusarium* wilt: understanding the agroecological distribution of pathogenic forms and developing disease management strategies *Agustin B. Molina, Robert C. Williams, Catur Hermanto, Suwanda, Birte Komolong and Pere Kokoa, Final Report for HORT/2005/136, www.aciar.gov.au/publication/FR2010-12*

Use and improvement of sugarcane germplasm *Fan Yuanhong, Li Qi Wei, Deng Haihua, George Piperidis and Terry Morgan, Final Report for CIM/2000/038, www.aciar.gov.au/publication/FR2010-11*

Huanglongbing management for Indonesia, Vietnam and Australia *George Andrew Charles Beattie, Tony Haigh, Susamto Somowiyarjo, Siti Subandiyah, Andi Trisyono, Arry Supriyanto, Ngo Vinh Vien, Pham Van Lam and Nguyen Minh Chau, Final Report for HORT/2000/043, www.aciar.gov.au/publication/FR2010-10*

PNG AND THE PACIFIC

Training in soil assessment and scientific writing for aquaculture officers in Papua New Guinea, *Jesmond Sammut and Jacob Wani, Final Report for FIS/2009/027, www.aciar.gov.au/publication/FR2010-16*

NEW PROJECTS

AH/2009/022	Improved investigation, diagnosis and technical support for the control of respiratory diseases of pigs in the Philippines and Australia
CSE/2009/037	Improved rice establishment and productivity in Cambodia and Australia
CSE/2009/004	Developing improved farming and marketing systems in rainfed regions of southern Lao PDR
FIS/2008/023	Increasing production from inland aquaculture in Papua New Guinea for food and income security
FIS/2007/124	Diversification of smallholder coastal aquaculture in Indonesia
FST/2008/010	Development and delivery of germplasm for sandalwood and whitewood in Vanuatu and northern Australia
HORT/2006/107	Strengthening the Cambodian and Australian vegetable industries through adoption of improved production and postharvest practices
HORT/2008/011	Strategies for using floriculture to improve livelihoods in indigenous Australian and Pacific island communities
LWR/2007/113	Impacts of climate change and watershed development on whole-of-basin agricultural water security in the Krishna and Murray–Darling Basins
LWR/2008/019	Developing multi-scale climate change adaptation strategies for farming communities in Cambodia, Lao PDR, Bangladesh and India
PC/2008/044	Pacific Agribusiness Research for Development Initiative
SMCN/2008/008	Increasing vegetable production in Central Province, Papua New Guinea to supply Port Moresby markets
SMCN/2009/013	Sustainable management of soil and water resources for oil palm production systems in Papua New Guinea

ACIAR'S DISTRIBUTION POLICY

ACIAR provides complimentary copies of its publications to developing-country libraries, institutions, researchers and administrators with involvement in agriculture in developing countries in ACIAR's operating areas, and to scientists involved in ACIAR projects. For enquiries about complimentary copies, please contact ACIAR's Communications Unit, **comms@aciar.gov.au**.

For other customers, please use our online ordering facility at **www.aciar.gov.au**, or direct enquiries to our distributors, National Mailing & Marketing, PO Box 7077, Canberra BC ACT 2610, Australia, phone +61 2 6269 1055, fax + 61 2 6260 2770, **aciar@nationalmailing.com.au**.

Copies of most publications are available as free downloads from the ACIAR website, **www.aciar.gov.au**.

ACIAR'S VISION

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

The Australian Centre for International Agricultural Research (ACIAR) operates as part of Australia's international development cooperation program, with a mission to achieve more productive and sustainable agricultural systems for the benefit of developing countries and Australia. ACIAR commissions collaborative research between Australian and developing-country researchers in areas where Australia has special research competence. It also administers Australia's contribution to the International Agricultural Research Centres.

Back cover: Children sit beside metal silos used for storing maize grain in Embu, Kenya. The silos are becoming a familiar sight for the children. They can be made by local artisans using readily available materials, take up little space and enable farmers to store their grain without losses.

PHOTO: CIMMYT

Front cover: Rashid Said Mpinga, a farmer in Tanzania's Morogoro district, holds up ears of TAN 250 maize, one of two improved, drought-tolerant varieties recently developed and registered for sale in Tanzania through CIMMYT and Tanzanian seed company Tanseed International.

PHOTOS: ANNE WANGALACHI, CIMMYT

ACIAR
Research that works for developing countries and Australia

www.aciar.gov.au