Cambodian farmers transporting native grasses to feed their family’s cattle in the traditional feeding system.

RESEARCH NETWORKS THE

The Consultative Group on International Agricultural Research (CGIAR) is a vital cog in research against global food production failing. ACIAR’s partnership and networks with the CGIAR extends from the smallholder farms of Cambodia to the US capital, Washington, DC.

Key points:
- ACIAR collaborations with the international agricultural research centres of the CGIAR prove their worth in reducing poverty.
- Projects deliver an average rate of return of 43% in 700 CGIAR projects evaluated.
- Worldwide there is a growing trend towards evaluating impacts to better target agricultural aid.

BY KELLI PENFOLD
Cambodian family planting a forage ‘fodder bank’ can make the difference that allows a child to no longer spend 8 hours a day cutting native grasses to feed their cattle and, instead, attend school. And if the family faces less production risk and better market access—through improved agronomy and better trade policy via international agricultural collaboration—a pathway out of poverty is created.

Improved cattle production means different things to different farmers. Some want to produce more cattle, some want to reduce their labour so they can take on higher-earning off-farm work, while others want their cattle to be more than just insurance, but a steady, reliable income.

Whatever the personal aspiration, productivity improvement can alleviate risk and supplement the potential for increased household income, which directly influences the level of health and education a family can access.

Agricultural growth is recognised worldwide as a key to reducing poverty, which is why an
agriculturally advanced nation such as Australia is committed to the Millennium Development Goals and delivering aid to alleviate poverty in developing countries. Utilising the research capabilities of the Consultative Group on International Agricultural Research (CGIAR) increases the ability of Australia to help the global poor.

Experience has shown that a multi-faceted approach to agricultural research has the greatest impact. This is why the CGIAR has had such a strong influence on the capacity of farmers in developing countries to keep food production ahead of upwardly spiralling populations.

The CGIAR system—with which ACIAR has had long-standing research partnerships—has been crucial to agriculture meeting the challenges of poverty and food security and, wherever possible, start building agricultural economies that extend smallholder farms from basic food production to income-earning enterprises.

The CGIAR centres give ACIAR access to a global network of researchers that can be assembled into effective research collaborations able to bring a breadth of skill and expertise into development projects.

This is encapsulated in CGIAR's stated mission: “to achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities in the fields of agriculture, forestry, fisheries, policy and environment.”

Established in 1971, the CGIAR comprises 15 centres and has 64 members, including ACIAR, working in collaboration with hundreds of government and non-government organisations, as well as private enterprise. There are more than 8,000 CGIAR scientists and staff in over 100 countries.

A measure of the CGIAR’s effectiveness is the

What is a forage fodder bank?

With Cambodian farmers' small landholdings dedicated to growing rice and vegetables, food sources for their cattle are traditionally located off-farm.

A 2008 survey in Prey Chhor, Kampong Cham, Cambodia, found that, on average, households were spending 7.3 hours a day collecting native grasses to be used as supplementary feed for cattle, which are predominantly fed a rice stubble diet.

By the International Center for Tropical Agriculture (CIAT) introducing forage feed banks—where forage grasses (Panicum maximum ‘Simuang’ and Brachiaria hybrid ‘Mulato’) are grown on small areas of, on average, 485 square metres—the survey found that adopters were saving 2 hours a day. The fodder banks are planted in whatever spare ground can be found—alongside houses, on roadsides and in paddock surrounds.
World Development Report 2008, which showed that investment in agriculture has delivered an average rate of return of 43% in 700 projects that were evaluated.

The ACIAR-funded ‘Cattle in Cambodia’ project, now in the third year of its 4-year funding agreement, is one such example. Research partners report that the outcomes for farmers who have lifted productivity through better forage crops have exceeded their ‘wildest dreams’, due to the spirit of cooperation and the ability to build on the gains of previous projects through the continuity provided by a CGIAR centre.

In partnership with the Laos-based International Center for Tropical Agriculture (CIAT) and in conjunction with the Royal Agricultural University and Department of Animal Health and Production in Cambodia, the Cattle in Cambodia project follows successful projects in Laos and earlier trials in Cambodia with similar aims—that is, to improve feed availability and quality throughout the year while reducing labour.

ACIAR research program manager for animal health Dr Doug Gray says the production systems and social conditions vary greatly between Laos and Cambodia, but lessons learnt in Laos mean change can be effected much faster in Cambodia.

Australian animal nutritionist Dr Darryl Savage, from the University of New England, has been involved on the ground in Cambodia. He says it is an advantage being able to capture knowledge and skills already created on previous CIAT-managed projects.

When this project was launched, Dr Werner Stür and Dr Sorn San—the Cambodian-based leaders of an earlier program funded through other international agencies—were able to connect with the farmers. “That farmer-driven model has been successful in Laos with cattle, buffalo and pigs so it is a method easily adopted in Cambodia, despite the different conditions,” Dr Gray says.

The project has three trial sites: Prey Chhor (established in the earlier work), Tbong Khmum and Kang Meas (the only site where trial pastures are irrigated). In 2003 the CIAT-managed ‘Livelihood and Livestock Systems Project’ introduced forages to Prey Chhor farmers, which could be grown near their homes in ‘banks’ to supplement the rice straw diet of their cattle (usually two to five head), saving them 8 hours’ work a day collecting native grasses.

Project surveys in 2008 found the average Cambodian cattle enterprise was 1 hectare, with four cattle supporting five or six family members.

A sign of the success is that Prey Chhor farmers are already selling cuttings of the forage to farmers from other regions. Other farmers are starting to fully use the forage crops by buying-in cattle for fattening, turning them over more quickly.

“If you can walk away from a project and your work is continued by the farmers then that is success,” Dr Savage says. “Never in our wildest dreams did we anticipate this would happen so quickly or that the level of adoption—often with farmers who have had nothing to do with the trials—would be as great as it has been.”

THE ROLE OF POLICY

The Washington-based International Food Policy Research Institute (IFPRI), a CGIAR centre, seeks to end hunger and poverty through policy solutions.

The two premises of this mission are that:

- sound and appropriate local, national and international reform of public, domestic and trade policies are needed to achieve sustainable food security and nutritional improvement
- the dissemination of results is critical to raising the quality of food-policy debate and formulating sound and appropriate policies.

ACIAR funded two recent projects to help farmers in developing nations capture more income from the opening up of world trade, particularly to China and India.

One explored alternative futures for agricultural knowledge, science and technology through a collaboration between the World Bank, the Australian Bureau of Agricultural and Resource Economics, the Center for Chinese Agricultural Policy and the National Council of Applied Economic Research in China.

The project made an up-to-date analysis of the food and environmental situation for the current debate on world food prices, security and climate change, with individual assessments for China and India. This information was then provided to the International Assessment of Agricultural Science and Technology for Development (IAASTD) secretariat. ACIAR policy adviser Dr Simon Hearn says the project was influential as it provided factual information that influenced the food security debate.

“You can’t have an informed debate without good research and this research takes place without concern about the political impact of policy—it just spells out the positives and negatives of policy change options,” he says.

“Good policy helps gain value from science. For example, if fertiliser subsidies are removed or reduced, farmers might use fertiliser more carefully, benefiting the environment and in some cases enhancing sustainable productivity.”

The true impact of economic and trade policy is well understood through IFPRI projects, such as one that examined the impact...
of China’s membership of the World Trade Organization (WTO) (it became a member in 2001) on rural and smallholders in western China. This ACIAR-funded project was a collaboration between the Chinese Academy of Sciences, the Chinese Academy of Agricultural Sciences and China’s Gansu Agricultural University.

More than 70% of China’s poor live in the country’s western region. The 3-year study found that poor infrastructure and resources in this region were hampering poverty reduction and agricultural growth.

The project analysed policy impacts on several levels—country, regional, township, village and farm household—so policy options could be developed that would help the western region reduce poverty, grow economically and be buffered from adverse shocks under the WTO.

It found coastal China stood to benefit from market opportunities, but lack of infrastructure and barriers to fiscal transactions meant the western region had little to gain.

The report developed a series of policy formulations to target public provisions for smallholders by encouraging investment in infrastructure, health, education and agricultural technology, rather than allowing funds to be swallowed by local bureaucracy.

Dr Heam says the benefit of working with a CGIAR centre is access to critical mass and existing infrastructure, including human resources, which reduces the time and money used in establishing new projects, meaning more dollars are directed to making an impact.

**COLLABORATION BREEDS SEEDS FOR LIFE**

The power of international agricultural collaboration is borne out in the Seeds of Life (SoL) program in East Timor, now in its tenth year.

When East Timor was granted independence in 1999 its one million people were left with no infrastructure, no agricultural research facilities, few human resources and no access to quality seed to grow the crops that, today, 150,000 households rely on for food and income.

Among the CGIAR, the International Rice Research Institute (IRRI), the International Center for Tropical Agriculture (CIAT), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Maize and Wheat Improvement Center (CIMMYT) and the International Potato Center (CIP) came forth with suitable crop varieties for the Seeds of Life program. The program is within the East Timor Ministry of Agriculture and Fisheries (MAF) and is co-funded by ACIAR and AusAID.

Variety-evaluation trials focus on sweetpotato, maize, rice, peanuts and cassava—all staple crops for preventing malnutrition and with the scope for yield gains to help meet demand. Each international centre supplies potentially suitable varieties for cultivation in East Timor, which are evaluated in replicated on-station trials to identify one or two varieties for on-farm trials.

On-farm trials allow farmers to evaluate the new varieties on their own farms under local conditions. The farmers also compare the taste and cooking characteristics of each with their local varieties prior to making a selection for planting the following year. These trials are established in seven of the 13 districts across East Timor each year, ensuring the researchers can evaluate suitable varieties across a range of environments.

Seed production of tested and proven high-yielding varieties is now the focus of the program, with more than 15,000 farmers given SoL seed to grow on a larger scale for the 2009–10 season.

MAF has released nine new varieties of the five staple food crops (maize, sweetpotato, peanuts, rice and cassava). To provide the data for these releases, in recent years SoL, has conducted more than 30 replicated germplasm-evaluation trials and more than 700 on-farm trials each year.

More than 3,000 participating on-farm trial households have grown at least one of the new varieties, experiencing yield increases on their farms of more than 50% for maize and 80% for sweetpotato. Distribution of seed by non-government organisations and directly by MAF has reached many more farmers.

Rob Williams, the project’s Australian team leader, oversees a large staff, including 40 agricultural scientists conducting experiments across a range of species in 17 of the 65 East Timor subdistricts.

“The genetic resources of CGIAR centres are critical to the success of this project,” he says. “We have growers who have hosted trials for us and within 2 years are growing the new varieties, which are selected because they offer a higher yield and taste good, as well as working with existing agronomy.”

The farmers, Mr Williams says, respond greatly to the improved taste or colour of produce and will often seek varieties on those traits alone. One farmer who had never had contact with SoL found impressive sweetpotatoes at a local market and travelled 50 kilometres to find the source—a SoL trial farmer—from whom he purchased cuttings to grow on his farm.

“Farmers have quickly created an economy around the crops, generating cash by selling product of the new varieties,” he says. “Generally, the farmers then put that money towards education and health, which fights poverty.”

As to the next phase of SoL, Mr Williams thinks expansion of seed production and work with more temperate crops, such as red beans and European potatoes, would benefit farmers at higher altitudes where farmers successfully grow plums, wheat and barley. He also envisages that distribution of the new varieties will be expanded by establishing community-based seed production groups.

More information: www.cgiar.org

Cambodian farmers have already moved into private enterprise, selling fodder plants to fellow farmers so they can establish their own fodder banks.