



Australian Government

**Australian Centre for
International Agricultural Research**

SUBMISSION TO THE

**FOREIGN AFFAIRS, DEFENCE AND TRADE REFERENCES
COMMITTEE**

**Inquiry into the delivery and effectiveness of Australia's
bilateral aid program in Papua New Guinea (PNG)**

March 2015

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Executive Summary

This submission details the delivery and effectiveness of the Australian Centre for International Agricultural Research (ACIAR) engagements with and in PNG.

ACIAR is a statutory authority that operates as part of Australia's aid program. ACIAR assists and encourages agricultural scientists in Australia to use their skills for the benefit of developing countries while at the same time working to solve Australia's own agricultural problems. ACIAR has facilitated agricultural research in PNG for three decades. In that time, ACIAR has commissioned and managed some 180 research projects. There are currently 30 active, and another 22 pipeline, projects. Total direct investment to date is approximately A\$200 million, with significant matching and in-kind contributions from partners both in Australia and in PNG.

ACIAR's research in PNG, as outlined in this submission, aims to help secure improvements in food supply, food access and rural incomes for smallholders through increased productivity and enhanced access to markets and services. ACIAR's assistance aims to complement, not substitute for, PNG's own investment in priority areas. While working with national institutions, ACIAR's programs are delivered at a local level, with active engagement with smallholder farming, fishing and forestry families.

ACIAR also supports targeted training programs, within projects and through the John Allwright Fellowships (postgraduate degrees in Australia), and the John Dillon Fellowships (high-level research management training).

Agriculture is by far the most important sector in PNG for providing both livelihood and economic opportunities for the majority of the population. Over 80 % of the PNG population relies on agriculture for home consumption and cash incomes.

Despite an endowment of natural resources, which have underpinned strong economic growth during the past decade, some 40% of PNG's population live in poverty; the vast majority of these live in rural areas. ACIAR's work helps the underprivileged rural majority.

The submission responds to each of the terms of reference:

- a) ACIAR's work aligns closely with the political, economic and social objectives of Australia's aid, and with PNG national priorities. It supports Australia's national interests by contributing to sustainable economic growth and poverty reduction and enhanced regional stability. With strong aid-for-trade underpinnings, and focus on women's economic empowerment, ACIAR's work supports both private sector development and human development, particularly across agriculture and fisheries.
- b) ACIAR works with a wide range of multilateral and regional organisations, non-government organisations, Australian civil society and other donors. The submission details the nature of these relationships.

- c) ACIAR sees considerable scope for increasing private sector involvement in sustainable economic growth and reducing poverty in PNG. ACIAR has numerous examples of projects with private sector partners in PNG and is both building on the strengths of current private sector partnerships, as well as exploring new ways to support inclusive business models.
- d) ACIAR's work with the private sector (such as agribusinesses, input suppliers and finance institutions), creates opportunities for smallholder farmers to realise immediate benefits – from improved farm productivity and product quality through the market access that the private sector partners can facilitate. ACIAR has successful examples in other countries, such as Indonesia, that can conceivably be transferred to the PNG context.
- e) Independent analyses have confirmed that ACIAR's work has contributed positively to PNG's progress towards internationally-recognised development goals. ACIAR's program in PNG aligns closely with and supports the UN's Open Working Group proposal for Sustainable Development Goals, as well as PNG's national priorities.
- f) ACIAR's activities in agricultural research for development are intimately connected with, and contribute to progress in, health, education, and women's empowerment, both directly and indirectly. Conversely, poor health services, low education levels, gender inequality, a lack of quality infrastructure, insecurity, and weak governance constrain agricultural and economic development.
- g) ACIAR has a highly-regarded program of independent performance evaluations, impact assessments and adoptions studies. Evaluations have shown that aid investments in agricultural research for development offer tangible benefit to PNG's rural people and, in the longer term, accelerating PNG's economic development.
- h) ACIAR draws on successful initiatives in other countries to improve development outcomes in PNG. The submission presents some examples.

Despite challenges, ACIAR's program in PNG has been independently assessed as effective and delivering results. It will continue to do so only through sustained commitment and a continued relentless focus on impact.

Background

The Australian Centre for International Agricultural Research (ACIAR)

The Australian Centre for International Agricultural Research (ACIAR) is a statutory authority that operates within the Foreign Affairs and Trade portfolio. The Centre's activities are part of Australia's aid program, with the objectives of advancing Australia's national interest through sustainable economic development that reduces poverty. ACIAR was established in 1982 to assist and encourage agricultural scientists in Australia to use their skills for the benefit of developing countries while at the same time working to solve Australia's own agricultural problems.

ACIAR facilitates the undertaking of agricultural research in PNG, and other developing countries, by working with the countries to identify their needs and priorities. These are matched with Australian research providers who identify the opportunities to extend their work to meet developing country needs in agricultural science and related disciplines. ACIAR also funds research to assess and enhance the policy environment affecting the adoption of the results of the research undertakings.

ACIAR commissions research groups and institutions, including universities, CSIRO and State departments of primary industry, the private sector and non-government organisations (NGOs) to carry out agricultural research projects in partnership with their counterparts in PNG and in other developing countries. In this submission the term 'agriculture' includes fisheries and forestry.

Against this background ACIAR, with its partners, delivers:

- new technologies that enhance agricultural productivity, food sufficiency, diversification and health and nutrition
- new knowledge that improves agricultural productivity and management systems and enhances market opportunities
- greater capability for scientific excellence, agricultural innovation and agribusiness development among researchers, research institutions, policy makers and development partners
- better decision-making within research and policy institutions to support agricultural innovation and agribusiness development.

In this submission, detail is provided for the Foreign Affairs, Defence and Trade References Committee of ACIAR's engagements with and in PNG. ACIAR, as part of the Department of Foreign Affairs and Trade (DFAT) portfolio, is making this separate submission to the inquiry and acknowledges the strong alignment with the submission made by DFAT.

Papua New Guinea country context

Agriculture is by far the most important sector in PNG for providing both livelihood and economic opportunities for the majority of the population. The 2013 Australia–PNG Emerging Leaders' Dialogue (Hayward-Jones 2014) concluded that 'developing the agriculture sector should be a national priority'. Port Jackson Partners (2013), in a report commissioned by ANZ, found that 'the resources sector has a pre-eminent role in generating the wealth needed to invest in infrastructure and hence support agricultural development. Agriculture will be a longer-term opportunity and can drive long-lasting growth'.

Rich mineral deposits and large oil and gas reserves are major sources of wealth for PNG and have contributed to strong economic growth during the past decade (with GDP growth reaching 5.1% in 2013). However, the benefits of this growth have not been equitably distributed. More than 2 million people—or an estimated 40% of PNG's population—live in poverty, and the vast majority of these live in rural areas.

About 80 to 85% of the PNG population relies on agriculture for home consumption and cash incomes. Cash incomes are derived from the sale of export crops and the sale of fresh produce and processed products in domestic markets (including rapidly growing cities — representing a means to transfer wealth from urban to rural areas). Although the value of fresh produce sales is not captured by PNG's national statistics, agricultural experts believe that such sales provide cash incomes to more households than any other activity. PNG's most important smallholder export crops are coffee, which supports around 2.1 million households, and cocoa, which supports around 0.9 million households. Although palm oil is PNG's most valuable agricultural export, it provides income for a much smaller proportion of the population (an estimated 18,500 smallholder households produce about one-third of the crop, supporting approximately 200,000 people).

Livestock make a significant contribution to the livelihoods and health of more than 600,000 smallholder farmers in PNG, mainly through subsistence and small-scale commercial production of pigs and poultry. Small ruminants, cattle and inland aquaculture are playing an increasing role in this sector but the food security and economic benefits from these enterprises are constrained by poor management and a lack of livestock health services. Inadequate nutrition, poor reproduction, high mortality of young stock, and poor access to rapidly emerging urban markets are consistent issues restricting productivity of the livestock sector. Demand for animal protein is rising. In addition, the role that animal-sourced proteins play in providing adequate nutrition is being increasingly recognised. In particular, there is renewed focus on the importance of providing women of childbearing age and children under five with adequate nutrition to ensure they are able to lead healthy and economically productive lives. Local production of red and white meats probably accounts for only 40% of market volume, leading to reliance on imports to fill the gap.

About 60% of PNG is forested and 97% of these forests are owned by customary landowners. In addition there is a small plantation forestry sector and many smallholders are growing commercial trees as part of their agricultural systems. Forestry provides an important revenue source for the landowners, communities, industry and the Government and has contributed up to 8.6% of PNG's GDP. The PNG Government has a development objective pursuing downstream processing of forest products such that 80% of PNG timbers are processed in-country by 2030; if achieved, this would create more than 10,000 jobs as well as generate an additional K300 million of national income.

ACIAR's program in PNG

ACIAR's research in PNG, as outlined in this submission, aims to help secure improvements in food supply, food access and rural incomes for smallholders through increased productivity and enhanced access to markets and services. This is in line with the PNG Government's Medium Term Development Plan 2011–2015 to promote economic growth in the rural sector (comprising agriculture, forestry and fisheries).

ACIAR's assistance aims to complement, not substitute for, PNG's own investment in priority areas. ACIAR has a formal program of consultation with PNG to establish priorities in research collaboration, as well as annual smaller consultations and industry workshops to fine-tune these priorities. The most recent set of formal consultations was held during March–October 2011. Key areas identified as research priorities, necessary to improve the livelihoods of people by enhancing incomes and market access across the medium term, include:

- overcoming social, cultural and policy constraints to gaining benefits from agricultural technologies, particularly with respect to the equity, role and effectiveness of women
- smallholder vegetables and starchy staples
- commodity and market-chain analysis to guide policy and improve production and marketing for cocoa, coffee, coconut and oil palm crops
- smallholder forestry and agroforestry systems, and value-adding in wood and non-wood products
- enhancing livelihoods from smallholder fisheries, and inland and marine aquaculture
- increasing household income through enterprise diversification
- ensuring sustainability and resilience of production systems, including livestock health and production.

A program of discrete but interrelated projects has been developed against each of these seven priority research areas. Details of the research program and the existing projects are provided in [Attachment I](#). Several new projects are proposed to commence in 2015–16 and these are identified separately. A country consultation to reassess priorities is planned for 2015–16.

While working with national institutions, ACIAR's programs are delivered at a local level, with active engagement with smallholder farming, fishing and forestry families. Key principles in designing and executing the program include:

- engagement with the private sector, industry bodies and non-government organisations (NGOs) in partnership with government, both in undertaking research and in implementing research results that directly contribute to economic development
- research that assists smallholder farmers and landowners to improve their incomes through increased market access
- understanding the social, cultural and economic issues affecting farmer decision-making and management of risk, and the factors influencing adoption of new technologies
- close linkages among other ACIAR-funded programs in PNG and the Pacific island countries where relevant.

Training priorities are met mainly through targeted activities within projects, although support for postgraduate degrees in Australia (the John Allwright Fellowships), and high-level research management training (the John Dillon Fellowships) are also significant contributors to capacity development. In some instances, such as in a current fisheries project (FIS/2010/055) devoted to building research and project management skills in fisheries staff in Papua New Guinea, there is particular emphasis given to training.

Since 1982, ACIAR has commissioned and managed some 180 research projects in PNG. There are currently 30 active, and another 22 pipeline, projects. Total direct investment to date is approximately A\$200 million, with significant matching and in-kind contributions from partners both in Australia and in PNG.

Response to the Terms of Reference

TOR a) the political, economic and social objectives of Australia's aid

ACIAR's strategic approach to investments in PNG must be viewed through the lens of the Australian Government's broader economic diplomacy efforts. Economic diplomacy is at the core of the government's international engagement. This includes using the aid program to support Australia's national interests by contributing to sustainable economic growth, poverty reduction and enhanced regional stability. This is particularly important for PNG where, despite positive economic growth rates in recent years, social indicators remain among the lowest in the Asia-Pacific region.

The Australian Government's new development policy, *Australian aid: promoting prosperity, reducing poverty, enhancing stability*, focuses on two development outcomes: (i) supporting private sector development; and (ii) strengthening human development. Under the new policy, the Australian aid program has a sharper focus on our immediate neighbourhood. This has important implications for PNG, as Australia's closest neighbour.

Aid-for-trade and strengthening the private sector are priorities for the Australian aid program. Aid-for-trade expenditure is targeted to increase to 20% of aid program funding by 2020, from about 12% now. Aid-for-trade investments include support for infrastructure to increase agricultural productivity, connect farmers to markets, and improve the flow of agricultural goods across borders.

Agriculture, fisheries and water are, together, one of the six priority areas under Australia's new aid policy. The agriculture and fisheries sectors are key sources of jobs, incomes and exports in PNG, and will continue to play an important role in economic growth and poverty reduction. More than 80% of PNG's people live in rural areas and depend heavily on agriculture and fisheries. Women's economic empowerment in these sectors is integral to tackling poverty and maximising development outcomes.

The majority of PNG's mainly rural population are poor and an estimated 18% are extremely poor. Improving the lives of poor people and promoting stability in PNG are central to Australia's interests.

At the 22nd PNG-Australia Ministerial Forum in December 2013, 'Ministers acknowledged that aid investments need to target areas where Australian expertise can have an impact on sustainable economic growth, which is critical to raising living standards in Papua New Guinea over the long term'. In this respect, agriculture is without equal. Australia is justifiably regarded as a world leader in agricultural research and production systems. The research and innovation systems that support agricultural research in Australia are globally unique with a key part of the system being the engagement between industry, public research providers and the private sector. These are areas where Australia has particular value-add and leverage.

The Ministerial Forum communiqué¹ noted that Australia committed to undertake an assessment of its aid investment in PNG in close consultation with the PNG Government to reflect both Governments' priorities. The assessment will position the Australian aid program to address the key constraints to sustainable economic growth and equality in PNG, to focus on private sector led growth, and to be subject to clear performance benchmarks and mutual accountability for both investments and results.

The importance of the agricultural sector (and ACIAR's role in it) was reiterated in late 2014, at the 23rd PNG-Australia Ministerial Forum where ministers noted 'the importance of the development of Papua New Guinea's agricultural sector to broad-based economic growth' and 'welcomed the new DFAT-ACIAR Agribusiness Development Partnership, which will use Australia's expertise in agriculture to help Papua New Guinea's farmers and agribusinesses to improve yields and productivity of key commodities, and develop better quality products.' ACIAR is fast-tracking the development of this new Partnership, and anticipates commencing a five-project program of work in the first half of 2015.

PNG is one of Australia's most important development partners, and ACIAR's investment in PNG reflects this. ACIAR's PNG program recognises the many production, marketing and capacity-building challenges to agricultural development in the country, including poorly developed infrastructure, weak market signals and services, new pest and disease threats, poor product quality, and pressure on land and renewable resources as a result of population increases and mining development. Future effects of HIV/AIDS and other human diseases on the agricultural sector – including on labour availability, health and productivity – are taken into account, and gender issues are integrated into the program.

Agriculture will remain the economic mainstay for the majority of Papua New Guineans for many years to come. The most effective role of government, with the support of donors, is to put in place the enabling environment to facilitate increased production and trade of agricultural produce, focusing especially on those value chains that offer benefits to large numbers of producers, processors and other local value chain participants. Assessments over the years have concluded that many of the constraints on agriculture are the same as those impeding overall economic growth in PNG. These constraints include poor infrastructure (especially the poor condition of the road network); limited value-added processing; law and order problems; poor education and health standards; inability to alienate land as a result of customary land tenure; gender inequality; and poor governance standards, including within the PNG institutions responsible for agricultural development and marketing. Reducing the impact of these constraints is the principal focus of the Australian Government's current aid program, but much could be achieved through targeted agribusiness interventions with strong technical underpinnings in agricultural research and parallel capacity building.

The 2014 Australia–PNG Annual Partnership Dialogue (30 July 2014) agreed that 'the Governments of Australia and PNG establish a working group which would agree a

¹ http://foreignminister.gov.au/releases/2013/jb_mr_131211b.html

framework for implementing future private sector development programs, including in agriculture'. In response, ACIAR and DFAT have been developing a coherent program of agricultural research to drive economic development opportunities for rural communities, with a particular emphasis on (i) engaging the private sector; and (ii) women's economic empowerment. The program will commence in the first half of 2015.

TOR b) the role of multilateral and regional organisations, non-government organisations, Australian civil society and other donors

A typical partnership model in ACIAR's bilateral program is an Australian institution – such as a university, CSIRO or State department of agriculture – collaborating with an overseas National Agricultural Research System (NARS), on a 3–5 year project. ACIAR's program in PNG is delivered through partnerships with the private sector, multilateral organisations, NGOs, volunteer organisations, philanthropic organisations, and partner governments (national PNG and provincial).

Current partners in ACIAR projects (established or envisaged) include: PNG public sector research and extension services (especially the Cocoa and Coconut Institute Ltd (CCIL) and the Coffee Industry Corporation (CIC)), private sector cocoa and coffee buyers (especially Agmark and Monpi), Australian speciality chocolate manufacturers (Haigh's, Bahen's), local development NGOs (Monpi Sustainable Services, World Vision, Foundation for People and Community Development), Australian universities (including Sydney, Melbourne, Curtin, Charles Darwin, Canberra, James Cook, Sunshine Coast and Australian National University), the Queensland Department of Agriculture and Fisheries, PNG universities (University of Technology Lae, Pacific Adventist University, University of Natural Resources and Environment Vudal, and University of PNG) and international R&D organisations (CABI-SE Asia). Current ACIAR projects also link closely to animal and plant biosecurity surveillance undertaken in conjunction with the Australian Government Department of Agriculture (e.g. the Northern Australian Quarantine Strategy).

ACIAR has a longstanding partnership with the Secretariat of the Pacific Community (SPC), including a shared office in Suva, Fiji. ACIAR works to build and draw on the technical capacities of SPC in regional projects that include PNG.

In agriculture in PNG, aid delivered through short-term task-based consultancies has proved largely ineffective. The intractable nature of many agricultural challenges, as well as the need for patient investment in capacity building, requires sustained long-term research partnerships and trust. It also requires the engagement of a range of partners with different but complementary organisational and individual strengths and skills, to create an environment where collaborative work will continue long after a project concludes.

NGOs, are the backbone of PNG communities, In particular, faith-based organisations, provide not only traditional religious services, but also run about half of both elementary and primary schools. They also provide health services for about two-thirds of primary education and provide health care in rural areas. These organisations have long histories in, and strong and established links with, communities. ACIAR has many examples of

successful partnerships and lasting interactions with non-government and faith-based organisations, such as the project with the Baptist Union in improving women's business acumen where financial literacy and planning for improving agricultural production are provided to families as part of an integrated community development package.

Whilst ACIAR's primary mandate is to develop and test agricultural innovations, research outputs are often utilised by other organisations and scaled-out to achieve stronger impact. ACIAR has many examples of other organisations scaling out its research outputs such as the World Bank utilising an extension strategy, known as 'Training by Association' for the management of cocoa pod borer in PNG. Just over 1000 farmers participated in testing the original package of extension strategies within an ACIAR project. However, once its effectiveness was demonstrated, the World Bank funded Productive Partnerships in Agriculture Projects, which plans to out-scale this strategy to over 18,000 farmers.

A recent ACIAR Project has worked with the Oil Palm Industry Corporation (OPIC) and the World Bank to recognise the needs of customary landowners. A new template for a Clan Land Usage Agreement (CLUA) developed in consultation with customary landowners, settlers and other stakeholders is now available at all OPIC project sites for use on Customary Rights Purchase Blocks (CRPBs). Typically, these are 2 ha blocks of oil palm planted on customary land by smallholders from outside the customary landowning group. The need for a new CLUA emerged because it was recognised that the majority of CRPB land transactions were informal and not in accordance with customary law. The new CLUA has recently been modified for in-fill plantings by the World Bank-funded Smallholder Agricultural Development Project (SADP).

TOR c) scope for increasing private sector involvement in sustainable economic growth and reducing poverty

ACIAR has a longstanding focus on private sector engagement across the breadth of its program. In PNG, we have numerous examples of existing projects with private sector partners. For instance, a forestry project working on balsawood has two private sector partners actively engaged and already it has produced tangible benefits such as the provision of improved balsa seed from the well managed balsa seed orchards that have been established on two companies' land.

Private investment by farmers is the largest and most important source of investment in agriculture in developing countries, averaging about US\$170 billion per annum (FAO 2012). Official development assistance (ODA) ranks as only the third largest source of financing flowing to the developing world behind private capital and remittances (Ion *et al.* 2014).

The Australian Government's new development policy provides the framework for the aid program to be more innovative in leveraging private sector investments, capacity and networks that contribute to poverty reduction, through inclusive business models that link low-income communities to agricultural value chains.

ACIAR is responding to this new policy direction both by building on the strengths of its current private sector partnerships and by exploring new ways to support inclusive business models. ACIAR continues to underpin these partnerships, and contribute to economic diplomacy and aid for trade, by working to enhance agricultural competitiveness and sustainability, and increasing market access and value-chain efficiencies and effectiveness.

Success of these approaches will be demonstrated by an increase in market-ready smallholders, market access and productivity and other impacts that are attributable to ACIAR's work — such as capacity building, policy development, sustainable practices and engagement with women.

What ACIAR offers the private sector

Strong partnerships with the private sector — built on trust, transparency, complementarity and mutual benefits — will enable greater innovation in research for development. This will lead to direct and indirect benefits flowing to the economies of developing countries and Australia. ACIAR has four key contributions to make to those partnerships:

- High quality research along value chains
- Delivering impacts from agricultural research
- Networks
- Credibility.

The private sector often highlights the value ACIAR brings as a research-broker with high credibility. ACIAR's reputation as an 'honest broker' places it in a unique position to enhance and facilitate the development of new partnerships in the sectors in which it works in PNG.

What the private sector offers ACIAR

Although relatively limited in scope and capacity in PNG, the private sector has resources, capabilities, networks and partners that are complementary to ACIAR's strengths in stimulating local economic development. In particular, the private sector has five key contributions to partnerships with ACIAR.

- Pathways to greater scale and impact
- Diversity of partnership models within value chains
- Access to value chain knowledge, technologies and innovation capacity
- Potential to leverage private sector investment
- Access to markets.

Enhancing ACIAR's engagement with the private sector

Given the rapid globalisation of agri-food chains and the opportunities and risks these present for smallholder farmers, the imperative for ACIAR to work with the private sector

has never been stronger. Many private sector firms linked to smallholder agricultural value chains recognise this imperative. As a result, ACIAR seeks to capitalise on new opportunities to link with the private sector, in inclusive business models, which contribute towards poverty alleviation by including lower-income communities within its value chain while not losing sight of the ultimate goal of business, which is to generate profits.

Through novel private sector engagements, ACIAR aims to contribute to economic development and poverty alleviation in PNG in four areas:

- wider adoption of research outputs
- inclusive models for women in agribusinesses
- stimulating private sector investment to capitalise on promising research outcomes and
- addressing agribusiness value chain constraints.

Although ACIAR seeks to achieve direct development impacts through its partnerships with the private sector, NGOs and public sector extension services, these are by design quite limited in scale; the main function of ACIAR's projects is to evaluate potential innovations and establish a plausible impact pathway to development outcomes. The planned co-investment by DFAT PNG in strengthening these development partnerships offers the opportunity to achieve immediate and wider development impacts – for instance by:

- the scaling out of production innovations, from adoption by a few hundred farmers in pilot project communities to adoption province-wide or nationally;
- identifying and addressing weaknesses in cocoa and other value chains;
- the establishment of markets and trade in agricultural products, such as sweet potato and Canarium nut, at an economically viable level, with positive impacts on employment and the economy; and
- the establishment or strengthening of delivery mechanisms for improved health and other community-level benefits.

TOR d) scope for expanding private sector partnerships in leveraging private sector investment and domestic finance

Finance institutions are increasingly providing credit to smallholder farmers but finding that success is linked to the provision of credible and appropriate technical information and reliable advisory services for improved production and/or marketing. This creates opportunities for partnerships between ACIAR and finance institutions that have mutual benefits towards a common goal: sustainable smallholder livelihoods, within profitable agribusiness value chains.

ACIAR's work with the private sector (such as agribusinesses, input suppliers and finance institutions) within inclusive business models, creates opportunities for smallholder farmers to realise immediate benefits – from improved farm productivity and product

quality through the market access that the private sector partners can facilitate. ACIAR has successful examples in other countries, such as Indonesia, that can conceivably be transferred to the PNG context.

ACIAR adopts innovative approaches to private sector partnerships. For example, a new sport fisheries project (FIS/2013/015) in PNG, funded jointly by ACIAR (12%) and the PNG National Fisheries Authority (NFA 88%), aims to empower NFA, the Tourism Promotion Authority, and business and community groups, all of which are directly involved in the R&D, to sustainably expand sport fisheries in PNG for the benefit of communities and associated businesses. The research is being coordinated by scientists from James Cook University. The World Bank has recently bought into the project, specifically to enhance the evaluation of the economic benefits of sports fisheries. The World Bank also intends to use the PNG project as a flag-bearer for a US\$30 million global program focussing on sports fisheries business development in developing countries.

The cash crop sectors in PNG (oil palm, cocoa, coffee) are all driven by private sector in varying degrees. The degree of success of ACIAR project adoption in these commodities can be directly linked to the level of involvement of the private sector, and their communication and access to communities.

TOR e) improving PNG's progress towards internationally-recognised development goals

The Australian Government's development strategy for PNG is to assist the PNG Government to progress towards the Millennium Development Goals (MDGs), reduce poverty and promote sustainable economic development, as expressed in the PNG Government's Medium Term Development Plan 2011–2015.

The world is transitioning to the post-2015 agenda. ACIAR's program in PNG aligns closely with and supports the UN's Open Working Group proposal for Sustainable Development Goals, specifically:

- Goal 1 End poverty in all its forms
- Goal 2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Goal 3 Ensure healthy lives and promote well-being for all at all ages
- Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 5 Achieve gender equality and empower all women and girls
- Goal 6 Ensure availability and sustainable management of water and sanitation for all
- Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 10 Reduce inequality within and among countries
- Goal 12 Ensure sustainable consumption and production patterns

- Goal 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

ACIAR's investments in agriculture, fisheries and forestry promote prosperity, reduce poverty and enhance stability through contributions to both private-sector development and human development. In particular, efforts in these sectors seek to:

- increase contributions to national economic output
- increase incomes of poor people
- promote sustainable management of natural resources
- enhance food, nutrition and water security.

The 2012 PNG New Voices Conference (Hayward-Jones 2012) concluded that 'agriculture and fisheries could be the driving forces behind a comprehensive economic transformation that delivered more equitable and sustainable growth'.

TOR f) supporting inclusive development by investing in good governance, health and education, law and justice and women's empowerment

ACIAR's activities in agricultural research for development are intimately connected with, and contribute to progress in, health, education, and women's empowerment, both directly and indirectly. Conversely, poor health services, low education levels, gender inequality, a lack of quality infrastructure, insecurity, and weak governance constrain agricultural and economic development.

Health

The 2014 Australia-PNG Emerging Leaders' Dialogue had as a key recommendation that 'Australian assistance in the agriculture sector should aim to attract investment in initiatives relating to smallholder agriculture, with particular attention to promoting a more balanced diet, crucial for the health and economic productivity of Papua New Guinea'.

Some examples of current ACIAR projects that support health through nutrition-sensitive agriculture include:

- Promoting traditional vegetable production and consumption for improved livelihoods in PNG and northern Australia²
- Examining women's business acumen in PNG: Working with women smallholders in horticulture³

² <http://aciar.gov.au/project/asem/2012/084>

³ <http://aciar.gov.au/project/asem/2010/052>

- Increasing vegetable production in Central Province, PNG to supply Port Moresby markets⁴

Education

ACIAR's modality of partnering researchers builds cultural understanding and skills exchange.

ACIAR's enabling legislation, the *ACIAR Act 1982*⁵, prescribes as one of the agency's functions to establish and fund training schemes related to its research programs. ACIAR supports postgraduate and research management training through the John Allwright⁶ and John Dillon⁷ Fellowships respectively.

The John Dillon Fellowship scheme provides career development opportunities for outstanding young agricultural scientists or economists from ACIAR partner countries who are involved in a current or recently completed ACIAR project. 8-10 Fellowships are offered annually.

The Fellowship aims to develop leadership skills in the areas of agricultural research management, agricultural policy and/or extension technologies. This is achieved by providing exposure to Australian agriculture across a range of best-practice organisations involved in research, extension and/or policy making.

The visit programs are tailored by negotiation between ACIAR and the selected Fellow to meet the needs of individual Fellows and their employing organisation. Arrangements for the Fellowships are flexible, and the following points are intended to indicate features of the program:

- Fellowships normally involve a 5–6 week period in Australia.
- Fellows are hosted in an Australian State to gain insight to the interaction between research, innovation and industry in Australian agriculture.
- Fellows participate in a formal research management and communications training course in Australia.
- Fellows undertake a structured program of visits to various institutes, including the presentation of relevant lectures.

The PNG universities review for the then Prime Ministers Somare and Rudd recommended 'twinning arrangements with Australian universities, first of all at institutional level, and separately and where appropriate at faculty, department and individual levels, all with focus on durable, long-term arrangements' (Garnaut and Namaliu 2010).

⁴ <http://aciar.gov.au/project/smcn/2008/008>

⁵ <http://www.comlaw.gov.au/Details/C2012C00015>

⁶ <http://aciar.gov.au/training/jaf>

⁷ <http://aciar.gov.au/training/JDF>

From March 2005 until 2012, ACIAR supported a Masters, Postgraduate Diploma, and Master of Philosophy program through the University of Technology (UniTech) in Lae. ACIAR withdrew once the program had matured sufficiently to be self-funding and locally resourced.

Women's empowerment

Gender inequality is significant in PNG and women suffer disproportionately from poverty and illiteracy. While women are involved in a diverse range of agricultural and market place activities, they are often excluded from activities that increase productivity. Empowering women has long been recognised as one of the most effective ways to alleviate poverty, because women are more likely to invest additional resources back into their family and community. Therefore, agricultural programs that include activities which generate income for women and empower them have stronger potential to alleviate poverty and drive economic growth, than those that do not consider gender.

PNG is extremely diverse, both geographically and culturally, and the sociocultural environment surrounding its agricultural and livestock systems is complex. ACIAR has invested in socioeconomic research in PNG to gain a better understanding of how livelihood improvements can be made and women can be empowered. A workshop held in Lae in June 2013 brought together researchers from Australia and PNG to share the accumulated knowledge and lessons learned from a suite of ACIAR socioeconomic projects (Hickey 2013).

ACIAR's investments, regardless of their objectives, effectively address gender issues in their conceptualisation, implementation and evaluation. One example is a recent ACIAR project focused on improving women's business acumen in PNG by working with women smallholders in horticulture (Chambers *et al.* 2012). It found that women smallholders face significant developmental constraints including limited access to productive resources such as land, water, machinery, seeds and fertilizer; low banking rates; limited financial skills; lack of access to credit; poorly developed transport systems; lack of understanding and access to markets; unequal gendered family roles and division of labour; restrictions to mobility; and overall lack of safety. Women smallholders have educational disadvantages due to low school completion rates, low literacy and numeracy and few accessible and gender- inclusive training programs or extension services. Although most women have strong aspirations to improve their family livelihoods, and invest in their children's education and well-being, the project has demonstrated that very few women smallholders have the business knowledge and acumen to improve their family livelihoods.

Another example is the 'Mama Lus Frut' scheme, established to increase the productivity of smallholder palm-oil plantations in PNG, and involving a direct payment to women for the collection of loose fruit. Women were issued with harvest nets and a payment card (referred to as the 'mama card'), which allowed them to collect loose fruit, sell it and receive their own monthly payment cheque. The scheme was fully installed in the Hoskins region in just two months in 1997, due to overwhelming interest. In 2002, the

concept of the mama card was extended, on a trial basis, beyond smallholder family members to unemployed persons in the community at large (Warner and Bauer 2002).

ACIAR also looks to empower female researchers, through involvement in project teams, and via targeted skill development and training opportunities.

Youth

Although not mentioned specifically in this term of reference, youth are important considerations in inclusive development, and particularly important in rural settings where rates of youth unemployment are frequently high. A key finding of the 2014 Australia–PNG Emerging Leaders Dialogue⁸ was that ‘the agriculture sector struggles to attract young talent and government attention in both Australia and PNG. This has flow-on effects for national food security and health in PNG and limits diversity and innovation in Australia’.

Given low levels of adult literacy, ACIAR employs a range of approaches to achieve adoption of improved agricultural practices and technologies. A recent example is the suite of ‘Maria’s family’ books, recently launched by Minister Bishop, aimed at school children:

- MN161- Maria’s family saves their kina [Femili bilong Maria sevim moni]
- MN160b- Maria’s family goes to market [Femili bilong Maria go long maket]—East New Britain edition
- MN160a - Maria’s family goes to market [Femili bilong Maria go long maket]—Western Highlands edition

TOR g) establishing realistic performance benchmarks to assess aid outcomes against set targets and to improve accountability

The Government’s performance framework, *Making Performance Count: enhancing the accountability and effectiveness of Australian aid* focuses on performance, results and value-for-money. ACIAR aligns with the Government’s 10 high level targets. ACIAR’s work contributes to promoting economic development and is reported in entirety as aid for trade investment. All of ACIAR’s investments explore innovative ways to promote private sector growth or engage the private sector in achieving development outcomes. ACIAR’s private sector engagement strategy provides further detail.

ACIAR contributes, wherever possible, to the development of DFAT’s country and regional Aid Investment Plans, which describe how Australia’s aid will promote economic growth in ways that provide pathways out of poverty. In search of innovative solutions, ACIAR actively engages with risk.

⁸ <http://www.lowyinstitute.org/publications/2014-australia-papua-new-guinea-emerging-leaders-dialogue-outcomes-report>

ACIAR's modality of project support with PNG research institutions presents relatively low potential for misappropriation, but has an associated cost in terms of the deployment of resources. ACIAR has an agency level fraud plan, and project-level strategies.

ACIAR seeks the most effective partners to collaborate in projects. It has in place a strong value-for-money framework, and actively measures its effectiveness, learns from experience, and adjusts or cancels projects that are not achieving results. The design and implementation of ACIAR projects ensure stronger links between performance and funding through clear milestone definition, monitoring and evaluation.

Impact assessment

ACIAR's impact assessment program is devoted to provide independent assessment of the performance of ACIAR's investments. Attachment II summarises recent independent impact assessments of ACIAR's program in PNG. These assessments confirm that ACIAR projects deliver high value-for-money. Beyond these economic benefits, numerous ACIAR impact studies and projects have highlighted the social, environmental and community benefits to families and livelihoods of ACIAR research outcomes.

Adoption studies

ACIAR has made a practice of revisiting a sample of past projects some time after their completion, and now has a series of adoption studies that spans the past decade. ACIAR commissions specialists to undertake assessments 3–4 years after a large project is completed to determine the level of uptake of the findings and gauge the extent of the project's legacy. This process has provided valuable insights that have helped in making decisions about further involvement in certain areas of research, and also provided accounts of lessons learned that aid in planning and developing new projects. Many have yielded success stories that further confirm the value of ongoing investment in agricultural research as a means of development assistance.

ACIAR's most recent adoption study (Pearce *et al.* 2013) reviewed studies of seven projects completed in 2008–09. Three of these involved PNG as the partner:

- Enhancing Papua New Guinea smallholder cocoa production through greater adoption of disease control practices
- Assessing and extending schemes to enhance the profitability of the PNG coffee industry via price premiums for quality
- Farmer evaluation and multiplication of sweetpotato varieties on the north coast of Papua New Guinea.

The reviews assessed outputs under three broad categories: (i) the emergence of new technologies or practical approaches to tackle problems or issues; (ii) the gaining of new knowledge that would lead to better understanding of scientific and socioeconomic aspects of agriculture; and (iii) the introduction of new structures to assist policymakers with decisions about the welfare of farmers and associated stakeholders.

All of the studies revealed medium to high levels of adoption of results. For example, the enthusiastic uptake of a PNG project's integrated pest and disease management (IPDM) for cocoa pod-borer improved yields and crop sustainability while averting a crisis that threatened the entire industry. These results have encouraged the adoption of IPDM by farmers in other countries.

ACIAR places great store on improving the capacity for research and development through project activities, and all these projects have shown substantial capacity-building outcomes. In most cases, the new research capacity and infrastructure introduced during the projects continue to be used.

TOR h) the extent to which development outcomes in PNG can be improved by learning from successful aid programs in other countries

ACIAR's support to PNG is both bilateral (between Australian and PNG research and policy institutions) and regional (between Australia, PNG and other countries, generally other Pacific island countries). Furthermore, SPC is an active partner in a range of ACIAR projects. Despite numerous challenges, the ACIAR program in PNG has delivered impressive results, confirmed by independent analyses (Attachment II). Outcomes in PNG and other Pacific island countries are enhanced by the sharing of experiences from successful projects through several mechanisms, including cross-program teams, thematic workshops, technical reports and publications, impact assessments, and regional engagements with SPC. One recent example relates to the establishment of a new community forestry project in PNG in which members of the Australian research team who have previously undertaken similar research in Philippines and Nepal are working with the PNG partners to capture relevant lessons from other community forestry projects to establish approaches that could be effective in the PNG context.

ACIAR aspires to be a learning organisation and, in many respects, can claim to be at the forefront in these endeavours (Jarvie and Stewart, *in press*). ACIAR's internal processes emphasise project and program review, and 'reviews of reviews'. ACIAR continues to develop systematic processes for generalising, spreading and implementing the results of learning (described as "double loop" learning in the academic literature). ACIAR also endeavours to create 'spaces' for learning', and to learn from failure. New investments are made on evaluation-based evidence.

ACIAR possesses a number of learning 'enablers', including small size; research-focus; a degree of autonomy (operates under statute); its field (agriculture) has a long and well-accepted history in evidence-based applied work. The organisation is well-attuned to designing outcome-oriented projects, and to measuring the impact of its work through systematic impact assessment.

There is potential to achieve far greater impacts that benefit many more people – particularly women and more marginalised groups – through closer cooperation and joint action between ACIAR and the broader aid program. Such cooperation must:

- seek to maximise impact and beneficiaries, and to target marginalised groups, especially women;
- focus on maximising economic opportunities and business development;
- work not only with farmers but with other value chain participants;
- engage with and use the commercial sector (in PNG and Australia); and,
- build capacity and address issues of sustainability.

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Attachment I

ACIAR's 2015 research program in PNG

Social, cultural and policy constraints to impact

The ACIAR PNG program is based on improved adoption of innovations that respond to needs and deliver benefits to PNG's smallholder farmers. Emphasis is placed on research that is economically, culturally, socially and environmentally relevant to the smallholder farmers. The program aims to help understand factors affecting innovation, and to respond to socioeconomic and human issues enabling or constraining potential uptake of new agricultural technologies.

For example, current research aims to identify and test the most culturally appropriate modes of packaging and postharvest handling, value-chain coordination, and communication and extension for sweetpotato. This integrated approach, taking into account social, economic and technical influences, increases the likelihood of adoption of new interventions, and results in systemic change and improved performance within the value chain.

ACIAR research in PNG has a focus on the roles of women in agriculture, including women's access to markets and their uptake of new technologies. Research contributes to improving the livelihoods of PNG women in agriculture by developing their business acumen.

Vegetables and starchy staples

The production and sale of vegetables and starchy staples provide an opportunity for increasing and diversifying household income. The ACIAR program in PNG aims to capitalise on these opportunities, with a particular emphasis on engaging women, families and community groups in markets. Root crops are traditional staple foods in PNG, and their vital contribution to food security is well recognised. However, the productivity of root crops is declining, as a consequence of shortening fallow periods, soil degradation and the build-up of pests and diseases. Building on the results of previous research, a closely integrated cluster of projects will further refine soil-management practices and develop new options for managing weevils, while both projects will provide technical support for a larger project seeking to strengthen the entire value chain for sustainable and market-oriented sweetpotato-based production systems in the highlands. The work on weevils will be closely linked with a region-wide project that is developing options for the management of the same two weevil species in the Pacific islands. A new project is identifying and validating potential horticultural diversification options for traditional leafy vegetables in Bougainville, and developing sustainable production systems and efficient value chains for these enterprises. Market-focused vegetable production in diversified systems in the highlands, that will also help secure nutritional security, will be addressed by a proposed project for the highlands.

Cocoa, coffee, coconut and oil palm production and marketing

Cocoa, coffee, coconut and oil palm provide major opportunities for PNG producers to increase export earnings and diversify farm incomes. Although large-scale plantations have accounted for much of the production in the past (and continue to do so for oil palm) expanding production in these crops will increasingly be in the domain of smallholders. The ACIAR program is focused on understanding and resolving the social, economic and biophysical constraints to smallholder production of these crops, including the adoption of sustainable integrated crop management (ICM) practices.

In cocoa, previous work in East New Britain has shown that smallholders can achieve good yields, even in the presence of cocoa pod borer, if they adopt a package of more-intensive management practices. A project now working country-wide seeks to understand and overcome the constraints that prevent some farmers from adopting these practices, and supplement the existing package through the deployment of newly available pest-resistant varieties. This work in turn feeds into two new projects, in Bougainville and other major producing areas, that will strengthen the value chain for cocoa and support related enterprise development, from the provision of better planting material, through intensified production techniques, to improved links to higher-value markets. A project focused on improving soil fertility and health in coffee and cocoa systems through soil management will also complement these plant protection projects.

New oil palm research also builds on previous work and focuses on the medium-term effort to better understand host-plant resistance to basal stem rot, a highly destructive fungal disease that threatens the sustainability of the crop. The project is using molecular markers to identify and exclude the most susceptible clones from future oil palm plantings.

Another new project aims to strengthen cocoa and oil palm farming systems and rural communities through the promotion of strategies to increase food and income security.

Forestry and agroforestry, and value-adding processing

The forestry program will focus on three of the four thematic priorities identified: maintaining work on planted forests, processing and value-adding of non-timber products, and developing a new focus on enhancing community-based forestry. Research will continue on improving germplasm, and on management and processing of high-value species such as balsa. In Western Morobe/Madang and East New Britain provinces research focuses on the establishment of demonstration stands of clonal teak trees to assist communities to manage these crops and to increase the communities' access to seed and plants of high-value timber species. In East New Britain province, aspects of the balsa production value chain will be improved, including germplasm, stand management, log supply logistics and processing systems working with landholder and industry groups.

In Eastern Highlands province, the Ramu–Markham valley and the Madang region, new research is focusing on enhancing livelihoods from community management of native

and planted forests through scaling up and sustainable management of forests and plantations by traditional resource owners. Another new research project will focus on enhancing value-added timber processing from planted and natural forests in Morobe province and other places where industry partners are willing to collaborate.

Fisheries and aquaculture

Through export and trade in domestic markets, fisheries and aquaculture products generate smallholder income, underpin food security and provide the potential for economic development. The ACIAR program contributes to the sustainable development of capture fisheries and aquaculture resources, evaluates and develops new opportunities and commodities, and enhances economic returns from production within the fisheries sector.

ACIAR's current aquaculture research program aims to increase fish production from inland farming systems to increase food and income security. In the focal provinces of Eastern Highlands and Morobe, research aims to develop aquaculture planning systems for management agencies and better fish-husbandry techniques, primarily for smallholder fish farmers.

ACIAR also supports mariculture development in PNG. Research is focussing on husbandry techniques for edible oysters, sea cucumbers and marine aquarium fish and scoping the mariculture potential of corals and spiny lobsters. A project developing the western Pacific pearl industry is investigating bottlenecks and the development of opportunities in the fledgling pearl-culture industries in Tonga and Fiji, and determining the potential for introducing 'half-pearl' culturing to PNG. Other research assists the development of locally based coastal sport-fishing ventures in PNG to enhance community livelihoods. Another project aims to comprehensively characterise the PNG shark and ray fisheries, and develop a framework for future fisheries conservation and management.

ACIAR is assisting the National Fisheries Authority in developing the research and project-management skills of fisheries research staff in PNG. The project's aim is to understand the mechanisms, processes and functionality of an integrated capacity-building program to increase research- and project-management skills underpinning aquaculture and fisheries projects in PNG, and to embed the skills within appropriate institutions.

Diversification and income generation

Diversification into other crop and livestock enterprises (e.g. flowers, fruits, non-timber forest products, small ruminants, and indigenous fish and poultry species) has the potential to provide smallholders with valuable additions to whole-farm income and increase household resilience through mixed-farming systems. The program aims to help smallholders diversify their production by identifying alternatives, linking farmers to markets, improving postharvest handling, reducing input costs while increasing yield and productivity, and sustainably managing landowner resources.

In East New Britain province, as well as in Solomon Islands and Vanuatu, research will focus on new technologies and options for developing export markets for the anticipated large volume of Canarium (galip) nuts that will become available within 5 years. A current project building on previous work on sweetpotato and cassava is developing mini feed mills to produce alternative feed sources for chickens, fish and pigs.

Sustainability and resilience of production systems

ACIAR assists in the proper diagnosis and evaluation of threats to both PNG and Australia from emerging pests and diseases and, as appropriate, develops immediate responses or longer term sustainable management strategies to deal with them. Capacity building and close collaboration with relevant Australian and PNG agencies play an important role in strengthening biosecurity arrangements.

The livestock industries of PNG, especially pigs and poultry, are at risk from disease entering the country through remote and poorly regulated entry points. A proposed project will build on previous work on monitoring livestock disease by exploring models for providing livestock health and production services. Improving the health and production of smallholder livestock through such services will in turn improve the livelihoods of producers and their communities.

In plant health research, a recently launched project seeks to improve understanding of Borgia coconut syndrome, a lethal disease of coconuts. Based on these insights, the project will work to develop a containment and management strategy while a complementary investment seeks to save the Pacific regional coconut genebank, which is immediately threatened by the disease. A proposed plant health project will focus on weeds troublesome to agriculture and forestry. It will develop a range of new options to control weeds, including deployment of known biological control agents to new areas and exploratory work on new target species. The project is based on previous successful work in PNG and Fiji, and on a scoping study that identified new priorities and opportunities for the biological control of invasive weed species in these and neighbouring Melanesian countries.

Consideration will be given to future projects focusing on enhanced adaptation to, and mitigation of, climate change, particularly for forestry systems.

5-year program outcome indicators

- Enhanced productivity and income growth through improved management of crops, livestock, fisheries and forestry
- Increased access to domestic and external markets for PNG smallholders
- Improved health, nutrition and livelihoods of rural communities through opportunities for diversified food production

2015 project output indicators

- Agreement reached on appropriate policy and operational responses to enhance value-added markets for balsa trees grown by farmers

- Social, economic and environmental constraints to industry development by smallholder farmers identified and documented with case studies on crop, fisheries and gender research
- Research options designed and initiated to reduce gaps in agricultural productivity and achieve diversified systems for crop, fisheries and poultry producers
- Risk management strategies, management programs or awareness programs relating to exotic pest, disease or weed incursion developed for at least two crop, livestock or across-commodity initiatives
- Partnerships established to commence a program of sweetpotato system research targeting sustainable production, diversification, value-chain development, value-addition and processing
- Partnerships and testing sites established for the dissemination of improved cocoa varieties and integrated production technologies in at least three major cocoa-producing provinces.

Attachment II

Independent impact assessments of ACIAR's program in PNG

Saving a staple crop: impact of biological control of the banana skipper on poverty reduction in Papua New Guinea

Publication Code: IAS022

ISBN: 1 86320 377 X

Date Released: 29/10/2003

Author(s): Marcia Bauer, David Pearce & David Vincent

The ACIAR-supported Banana Skipper project led to the successful introduction of a biological control agent against the butterfly pest of bananas that was reducing the productivity of the banana crop. This study focuses on the impacts of the project on poverty reduction, specifically through an examination of incomes. Poverty through income deprivation is a considerable problem in PNG, especially in rural areas where household income sources are dependent on subsistence agricultural. The study reviews the banana skipper project, agriculture in PNG and poverty, including the link between poverty and banana production. The study then concludes with the impact of the project on poverty reduction, both for producers and the flow on effects resulting from increased supply and price impacts.

URL: <http://aciar.gov.au/publication/ias022>

Identifying the sex pheromone of the sugarcane borer moth

Publication Code: IAS034

Date Released: 11/05/2005

Author(s): David Pearce

The project evaluated in this report helped to identify the sex pheromone (attractant chemical) of the sugarcane borer. This insect is a serious pest of sugarcane in Papua New Guinea, and is also regarded by quarantine authorities in Australia as the most serious insect pest threatening its sugar industry

URL: <http://aciar.gov.au/publication/ias034>

Mama Lus Frut scheme: an assessment of poverty reduction

Publication Code: IAS020

ISBN: 1 86320 362 1

Date Released: 24/10/2002

Author(s): Robert Warner and Marcia Bauer

The 'Mama Lus Frut' scheme was established to increase the productivity of smallholder palm-oil plantations in Papua New Guinea. The scheme involves a direct payment to women for the collection of loose fruit. Women were issued with harvest nets and a payment card (referred to as the 'mama card'), which allowed them to collect loose fruit, sell it and receive their own monthly payment cheque. The scheme was fully installed in the Hoskins region in just two months in 1997, due to overwhelming interest. In 2002, the concept of the mama card was extended, on a trial basis, beyond smallholder family members to unemployed persons in the community at large.

URL <http://aciarc.gov.au/publication/ias020>

Economic benefits to Papua New Guinea and Australia from the biological control of banana skipper (Erionota thrax)

Publication Code: IAS012

ISBN: 1 86320 266 8

Date Released: 24/07/1998

Author(s): D F Waterhouse, B Dillon & D Vincent

Using the estimated production value of bananas in Papua New Guinea to the year 2020, the losses due to banana skipper each year were calculated. Using a discount rate of 5%, the net present value of lost production amounts to approximately A\$301.8 million. The value of damage prevented by biological control is estimated at \$201.6 million. The reduction of banana skipper abundance by 90% in southern Papua New Guinea has also reduced the chance of adults invading Australia.

URL: <http://aciarc.gov.au/publication/ias012>

The biology, socioeconomics, and management of the barramundi fishery in Papua New Guinea's Western Province

Publication Code: IAS067

ISBN: ISSN 1832-1879, ISBN 978 1 921738 04 3 (print), ISBN 978 1 921738 05 0 (online)

Date Released: 21/07/2010

Author(s): Hayden Fisher

An impact assessment on the effects of introduction of the barramundi fishery management plan on fishing practices and fishing communities.

URL: <http://aciarc.gov.au/publication/ias067>

Forestry in PNG – a review of ACIAR's program

Publication Code: IAS073

ISBN: 978 1 921738 96 8 (print), : 978 1 921738 97 5 (online)

Date Released: 29/08/2011

Author(s): Hayden Fisher

This study provides an overall assessment of ACIAR's forestry program in PNG and takes a more in-depth look at projects relating to galip nuts.

URL: <http://aciarc.gov.au/publication/ias073>

Oil palm pathways: an analysis of ACIAR's oil palm projects in Papua New Guinea

Publication Code: IAS080

ISBN: 978 1 921962 83 7 (print) 978 1 921962 84 4 (online)

Date Released: 23/08/2012

Author(s): Fisher H., Winzenried C. and Sar L.

ACIAR has funded a range of oil palm projects in PNG. This report examines the pathways through which ACIAR's portfolio of oil palm projects, in particular the socioeconomic and biocontrol clusters – have delivered benefits to the community.

URL: <http://aciarc.gov.au/publication/ias080>

Attachment III

ACIAR Partners Magazine Special PNG issue, Spring 2012



Double click to launch or access via <http://aciar.gov.au/publication/pmg042>