

# Papua New Guinea and Pacific Island countries

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Papua New Guinea  
Pacific Island Countries

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## ACIAR Regional Coordinators



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*Dried fish (tilapia & carp) for sale at local Yonki markets*

# Papua New Guinea

GNI per capita (\$US) <sup>1</sup>	660	Bilateral actual 2005–06	\$4.70 m
Population <sup>2</sup>	5.8 million	Bilateral estimate 2006–07 <sup>6</sup>	\$4.73 m
Population 2015/2050 <sup>3</sup>	7.0/10.6 million	Bilateral budget 2007–08 <sup>6</sup>	\$4.45 m
Active bilateral projects <sup>4</sup>	34	Bilateral + multilateral	
Active multilateral projects <sup>5</sup>	3	budget 2007–08	\$4.83 m

<sup>1</sup> Source and for following chapters: Commonwealth of Australia, Australia's Overseas Aid Program 2007–08, Statement by Minister for Foreign Affairs, May 2007

<sup>2</sup> Source and for following chapters: United Nations Development Programme, Human Development Report 2006, <http://hdr.undp.org/hdr2006/statistics/>

<sup>3</sup> Source and for following chapters: United Nations Development Programme, Human Development Report 2006, <http://hdr.undp.org/hdr2006/statistics/>

<sup>4</sup> For all country chapters this figure indicates active bilateral projects as at June 2007

<sup>5</sup> For all country chapters this figure indicates active multilateral projects as at June 2007

<sup>6</sup> Includes AusAID-funded projects: \$2.1m (actual 2006–07) and \$1.87m (forecast 2007–08)

Country Manager  
Dr Jacqui Wright, ACIAR Country Manager,  
PNG and Solomon Islands



PNG Forest Research Institute staff discussing seedling development as part of a tree seedling nursery training course

## Key program managers

Dr Caroline Lemerle, Agricultural Systems Economics and Management

Dr Peter Rolfe, Animal Health

Dr TK Lim, Crop Protection

Mr Barney Smith, Fisheries

Dr Russell Haines, Forestry

Dr Jeff Davis, Policy Linkages and Impact Assessment

Dr Gamini Keerthisinghe, Soil Management and Crop Nutrition

## Key performance indicators

- Enhanced focus in project portfolio on improving the quality of commodities
- Maintain linkages between at least two ACIAR projects and projects funded under the new AusAID Agricultural Innovations Grants Scheme
- Greater involvement of PNG University of Technology in ACIAR's program
- Increased partnerships with other agencies promoting sustainable economic development, in particular the Ok Tedi Development Foundation and the PNG Sustainable Development Program
- Increased emphasis in ACIAR portfolio on sweet potato research and development, commensurate with its importance as a staple food
- Increased emphasis on promoting the role of indigenous nuts in local and export economies
- Stronger emphasis on enhancing the contribution of forestry to the national economy, in particular by linking commercial forestry to traditional agroforestry and community management of forests, and by strengthening domestic processing
- Extent of soil fertility decline of PNG highlands

quantified and suitable research and development investments to improve soil fertility implemented

- Constraints to expansion of inland aquaculture identified and strategic planning for development commenced
- Increased capacity for regional fingerling and feed supply to underpin aquaculture expansion
- 40% of new projects designed to have significant farmer or policy-maker impacts within five years of completion

## Medium-term strategy

ACIAR's strategy in Papua New Guinea (PNG) is to support applied technical and economic research aimed at the enhancement of incomes for smallholders and the broader community. Emphasis is placed on the social and economic context of the research, particularly with respect to involvement of women farmers. There are emphases on plantation crops, root and other horticultural crops, forestry and fisheries. These include exported and domestically traded commodities that generate smallholder income and underpin improved food security and economic development. Project design encourages private sector, industry and non-government organisation (NGO) linkages. Through programmatic focuses on biosecurity and on sustainable management of land, forest and fisheries resources, sustainability of renewable resources is encouraged. The PNG program has a strong emphasis on capacity building, with high priority given both to training within projects and postgraduate training. ACIAR will link closely with relevant AusAID programs,

particularly the Agricultural Research and Development Support Facility. PNG has several significant competitive advantages in relation to the production of timber—available land, good soils and climate, and a long history of successful incorporation of trees into agroforestry systems. The opportunity exists to develop a timber growing and processing industry many times larger than the current log export industry from primary forests.

## Position

Papua New Guinea is one of ACIAR's most important partners. ACIAR's investment and commitment in PNG reflects the deep, long-term relationship between the two countries. Overall, PNG is Australia's largest development partner. Australia is committed to seeing PNG develop and prosper. ACIAR's program in PNG has endeavoured to reflect this and, over recent years, the portfolio has increased significantly. Since 1998, AusAID, through a Record of Understanding, has provided ACIAR with an annual grant of \$2 million to fund agricultural research and development projects of mutual interest. In 2003, AusAID established the PNG Agricultural Innovations Grant Facility (AIGF), to support small projects in PNG agricultural research and extension institutions. Many of these projects relate to previous or current ACIAR-funded projects at these institutions. ACIAR will link closely with the new AusAID-funded PNG Agricultural Research and Development Support Facility.

Village-based agriculture supports 70–80% of the population, and domestic trading of fresh produce is a very important source of cash income. By far the most important crop in PNG is sweet potato. Other root crops are also important but well below sweet potato. The main export tree commodities are timber, oil palm, coffee, cocoa and coconuts. Domestic trading of fresh produce is a very important (and often under-recognised) source of cash income. Forestry is PNG's third largest revenue earner and a major contributor to the overall economic and social development of the country. PNG has several significant competitive advantages in relation to the production of timber—available land, good soils and climate, and a long history of successful incorporation of trees into agroforestry systems. The PNG fisheries zone of 2.4 million square kilometres is the largest in the South Pacific. The fisheries zone includes an extended reef system, numerous islands and an extensive coastline. These create huge opportunity but also present an enormous challenge for monitoring and control. The total market value of the PNG catch is estimated at \$A140–160 million. Pigs and poultry are important village animals and there are some live exports of cattle from Papua New Guinea. ACIAR will assist in the development of capacity to detect and manage infectious disease in the wider context of biosecurity arrangements and in collaboration with other Australian agencies.

ACIAR's program recognises the many challenges to agricultural development in PNG, including poorly

developed infrastructure, weak market signals and services, poor product quality, population pressure and future impacts of HIV/AIDS on the farming sector. Major changes to the rural environment over the last decade have included greater exposure to global markets, devaluation of the Kina, pressure on land and renewable resources as a result of population increases, and new pest and disease threats. These mean that as well as making a greater commitment to the implementation of the results of research, the need for on-going development of agricultural technologies remains strong.

ACIAR has funded some highly successful projects in PNG. Examples include control of the plant pest banana skipper and identification of the pheromone of cane borer (enabling its numbers to be monitored in the field), research on halting the spread of bee mites in PNG, conservation of indigenous plants, and management of the tuna industry. Much effort has gone into land-use planning and supporting policy development for PNG's food security. PNG's relative lack of resources and expertise is a constraint in R&D activities and in delivery of extension services. It is therefore crucial, when designing projects, to include training and packaging of research results in a form suitable for uptake by farmers.

## Relationship to the AusAID PNG strategy

AusAID's PNG country program supports the Government of PNG's medium-term development strategy focus on sustainable broad-based economic growth in PNG by working with PNG government agencies and systems to ensure better use of PNG's own resources to strengthen economic management, deliver essential services and improve law and order. The importance of strengthening political governance, building sustainable government institutions, exploiting opportunities to stimulate sustainable economic growth and maintaining service delivery is recognised. In 2007-08 the focus of the program will be on improved governance and nation-building, sustainable broad-based economic growth and increased productivity (including from the agriculture, forestry and fisheries sectors), improved service delivery and stability, and responding to the HIV/AIDS crisis.

ACIAR's PNG program, delivered with AusAID co-funding, supports the emphasis on economic growth by working with PNG government agencies to improve agricultural productivity. Partnership with PNG public and private institutions in agricultural research and development supports better use of PNG's own resources. With over 85% of the population in rural areas, development of agricultural industries and the smallholder cash economy will be critical to drive broad-based economic growth and improve rural livelihoods in PNG.

## Indicative priorities and current project portfolio

ACIAR has a formal program of consultations with PNG to establish priorities in research collaboration. These consultations are on a four-year rolling basis and were last held with PNG in September 2004; a record of the consultations is provided at [www.aciar.gov.au](http://www.aciar.gov.au) under *Partner country priorities/Papua New Guinea*.

The consultation achieved consensus on several overarching issues. These include the roles of the private sector, industry bodies and NGOs along with government in research and implementation of research results, and the importance of research that assists the engagement of smallholders in the cash economy. In a discipline sense, the ACIAR PNG portfolio will emphasise agricultural economics (including after-harvest activities), farming systems, crop protection, fisheries and forestry.

The priorities are grouped under four programmatic themes:

- applied research aimed to **maintain and enhance smallholder incomes**, with an emphasis on root, plantation, agroforestry and horticultural crops and aquaculture (the social and economic context of the research is emphasised, particularly with respect to involvement of women farmers)
- **sustainable management** of land, forestry and fisheries resources
- **biosecurity**
- **institutional capacity building, socio-economics and project assessment**, through development of human and physical resources.

### *Subprogram 1: Enhancement of smallholder incomes from agriculture*

#### A. Social and economic constraints and opportunities

- Research addressing social, economic and policy constraints and opportunities in smallholder production systems
- Market chain analysis (including quality incentives) for key commodities
- Analysis of international comparative market advantage of selected PNG agricultural commodities

#### B. Root and horticultural crops

- Conservation, characterisation and utilisation of plant genetic resources
- Improved productivity, nutrition and postharvest handling of products from smallholder farming systems, especially sweet potatoes and peanuts
- Management of pests and diseases of potato, sweet potato and other root crops
- Integrated crop management for highland vegetable production
- Maintenance of soil fertility with intensification of land use for annual crops

#### C. Tree crops

- Quality management, crop protection and marketing for cocoa and coffee
- Management of key insect pests and diseases of perennial fruit and tree crops and oil palm
- Maintenance of soil fertility in response to intensification of land use for plantation crops

#### D. Village-based aquaculture

- Enhanced productivity of existing inland pond aquaculture systems, and investigation of new opportunities including the domestication of indigenous species
- Assessment of market options and opportunities for aquaculture production
- Low-cost feeds and feeding systems for aquaculture

#### E. Forestry and agro-forestry systems

- Domestication and improvement of multiple-use, fast-growing indigenous tree species for smallholders and plantation development
- Processing of wood and non-wood products for value-adding and local industry development
- Improvement of traditional agroforestry systems, including fallow rotations, coffee, cocoa, vanilla cover crop management
- Development of non-timber forest products for communities

### *Subprogram 2. Sustainable management of forestry and fisheries resources*

- Native forest management, including ecology of forest regeneration after logging growth and sustainable yield planning (with information and inventory systems) for forest harvesting
- Sustainable management for smallholder woodlots and industrial plantations, addressing soil and nutrient conservation, productivity decline, and forest pests and diseases
- Reforestation of degraded sites, including grasslands and mine sites
- Simple village-level mariculture options for enhanced livelihoods and provision of tools to support sustainable management arrangements for inshore fisheries resources
- Cooperation in the assessment and management of shared fish stocks in Torres Strait and the Gulf of Papua
- Review of policies and strategies for the tuna fishery
- Assessment of impacts of fish-attracting-device-associated tuna fisheries on resource sustainability, particularly the capture of juvenile bigeye and yellowfin tuna

### Subprogram 3. Biosecurity policy and capacity enhancement

- Capacity building for identification, risk analysis and integrated management of plant pests, diseases and weeds
- Strengthening of surveillance systems to monitor and respond to livestock diseases

- Support for postgraduate degrees in Australia and an in-country scholarship scheme at Unitech, Lae
- Purpose-designed in-country courses in:
  - experimental design and statistical analysis, including management of data quality
  - research management, priority setting, monitoring and evaluation and impact assessment
  - scientific proposal writing and project design
  - presentation for scientific, extension, farmer and government audiences
  - collection and analysis of market information and training in extension approaches, including farmer participatory action research.

### Subprogram 4. Institutional and individual capacity building

- Training priorities mainly addressed through targeted activities within projects

## Current project portfolio

*(Possible new projects commencing in 2007–08 shown as 'proposed')*

### Subprogram 1: Enhancement of smallholder incomes from agriculture

#### A. Social and economic constraints and opportunities

ASEM/2001/037	Improving the marketing system for fresh produce of the highlands
ASEM/2004/011	Evaluating domestic tuna fisheries projects
ASEM/2004/041	Productivity and marketing enhancement for peanut in Papua New Guinea and Australia
ASEM/2006/023	Re-commercialisation of the PNG pyrethrum industry and improving harvested yields in Australia
ASEM/2006/127 (proposed)	Private sector/smallholder partnerships for improving incomes in oil palm and cocoa sectors in Papua New Guinea
ASEM/2006/129 (proposed)	Early warning for low rainfall periods and preparedness for crop management and storage
FST/2006/048 (proposed)	Improved processing, storage and packaging of Canarium nuts
HORT/2006/055	Development in the ornamentals industry in the Pacific: an opportunity for income generation
LPS/2005/094	Improving the profitability of village broiler production in PNG

#### B. Root crops

ASEM/2006/035 (proposed)	Improving marketing efficiency and postharvest handling of sweet potatoes in PNG
CP/2000/044	Taro beetle management in PNG and Fiji
CP/2003/029	Management of potato late blight in PNG
CP/2004/071	Reducing pest and disease impact on yield in selected PNG sweet potato production systems
HORT/2005/134 (Multilateral)	The use of pathogen-tested planting materials to improve sustainable sweet potato production in Solomon Islands and Papua New Guinea (CIP)
HORT/2006/106	Screening and field trials of high-carotenoid sweet potatoes for improving the vitamin A status of residents of the Solomon Islands and Papua New Guinea
SMCN/2003/010	Farmer evaluation and multiplication of sweet potato varieties on the north coast of PNG
SMCN/2004/067	Management of soil fertility in sweet potato-based cropping systems of the PNG Highlands

#### C. Tree crops

##### Cocoa, oil palm and sago

ASEM/2001/016	Microbial contaminants associated with sago processing and storage in Papua New Guinea
ASEM/2003/015	Enhancing PNG smallholder cocoa production through greater adoption of disease control practices
ASEM/2006/127 (proposed)	Private sector/smallholder partnerships for improving incomes in oil palm and cocoa sectors in Papua New Guinea
CP/2004/064	Biological control of 'mile-a-minute' ( <i>Mikania micrantha</i> ) in PNG, Fiji and Australia
PLIA/2005/149 (proposed)	A comparison of policy environments for cocoa technology adoption and industry development in Bougainville and other parts of PNG
SMCN/2000/046	Overcoming magnesium deficiency in oil palm crops on volcanic ash soils of PNG
SMCN/2006/031	Analysis of nutritional constraints to cocoa production in PNG

**Coffee**

ASEM/2004/017	Assessment and improvement of quality management during postharvest processing and storage of coffee in PNG
ASEM/2004/042	Assessing and extending schemes to enhance incomes of PNG smallholder coffee producers via price premiums for quality
ASEM/2004/047 (Multilateral)	Sustainable management of coffee green scale in Papua New Guinea (CABI)
PLIA/2006/004 (proposed)	Road improvement in PNG and implications for adoption of research outcomes for coffee growers

**D. Village-based aquaculture**

FIS/2001/083	Inland aquaculture in PNG: improving fingerling supply and fish nutrition for smallholder farms
FIS/2004/065	Culture of promising indigenous fish species and bioremediation for barramundi aquaculture in northern Australia and PNG
FIS/2006/001	Increasing capacity for regional fish feed manufacture in Papua New Guinea
FIS/2006/138	Developing aquaculture based livelihoods in the Pacific Islands region and northern Australia

**E. Forestry and agro-forestry systems**

FST/2003/049	Review of portable sawmills in the Pacific: identifying the factors for success
FST/2004/009	Facilitating the availability and use of improved germplasm for forestry and agroforestry in PNG
FST/2004/050	Value-adding to PNG agroforestry systems
FST/2004/055	Domestication and commercialisation of <i>Canarium indicum</i> in Papua New Guinea

**Subprogram 2. Sustainable management of forestry and fisheries resources**

ASEM/2004/011	Evaluating domestic tuna fisheries projects
FIS/2001/036	Maximising the economic benefits to Pacific Island nations from management of migratory tuna stocks
FIS/2005/096	Assessment of the impact of the PNG purse seine fishery on tuna stocks, with special focus on the impact of fish aggregation devices (FADs)
FST/2003/049	Review of portable sawmills in the Pacific: identifying the factors for success
FST/2004/050	Value-adding to PNG agroforestry systems
FST/2004/061	Assessment, management and marketing of goods and services from cutover native forests in PNG forests
FST/2006/088 (proposed)	Promoting diverse fuel wood production systems in PNG
FST/2006/120 (proposed)	Increasing downstream value-adding in PNG's forest and wood products industry

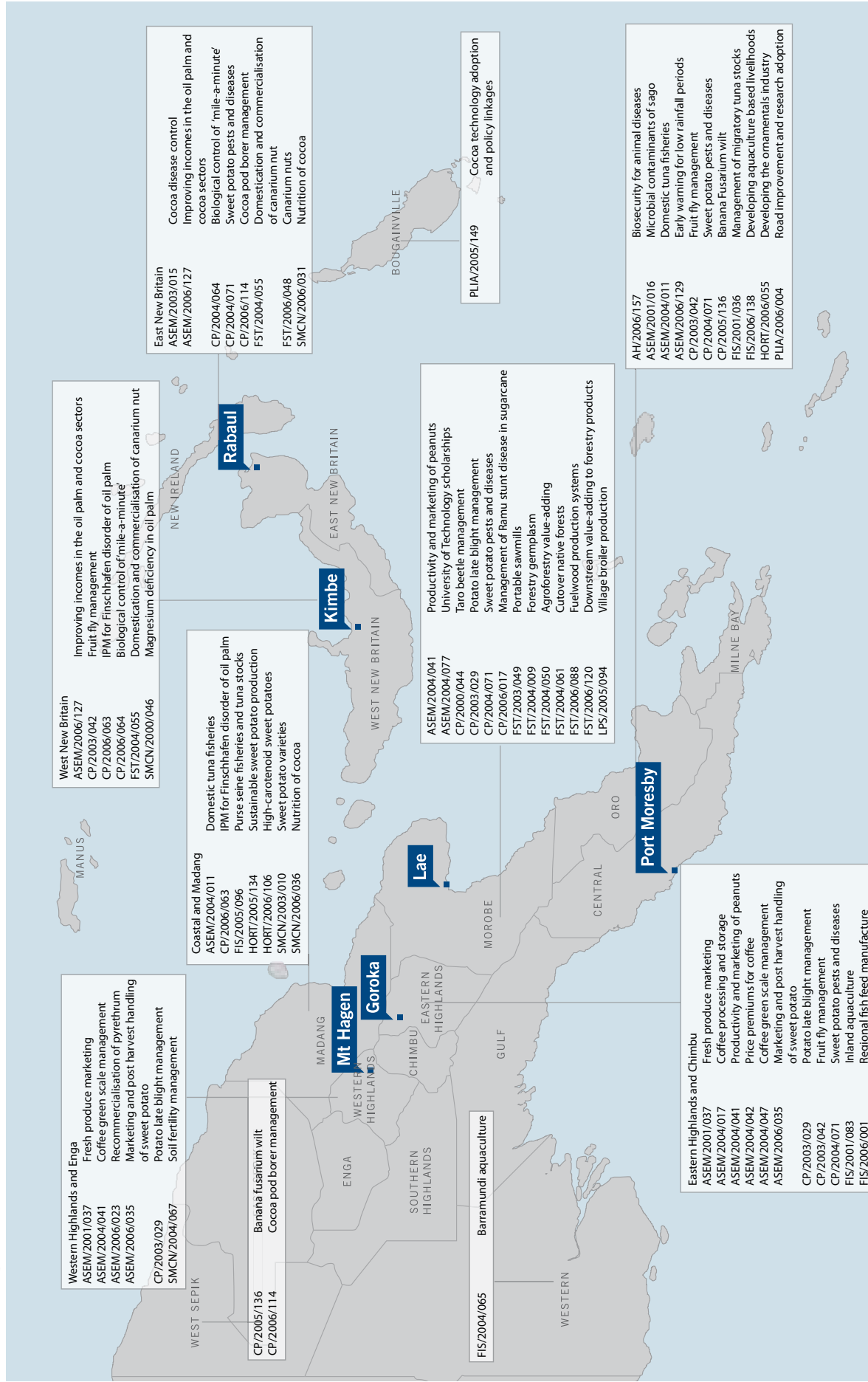
**Subprogram 3. Biosecurity policy and capacity enhancement**

AH/2006/157 (proposed)	Improved biosecurity for animal diseases in Papua New Guinea
CP/2000/044	Taro beetle management in PNG and Fiji
CP/2003/029	Management of potato late blight in Papua New Guinea
CP/2003/042	Fruit fly management in Papua New Guinea
CP/2004/064	Biological control of 'mile-a-minute' ( <i>Mikania micrantha</i> ) in Papua New Guinea and Fiji
CP/2005/136 (Multilateral)	Mitigating the threat of banana Fusarium wilt: understanding the agro-ecological distribution of pathogenic forms and developing management strategies (IPGRI)
CP/2006/017	Management of <i>Eumetopina flavipes</i> : the vector of ramu stunt disease of sugarcane in Papua New Guinea
CP/2006/063	Integrated pest management for Finschhafen disorder of oil palm in Papua New Guinea
CP/2006/114 (Multilateral, proposed)	Managing cocoa pod borer in PNG through improved risk incursion management capabilities, IPM strategies and stakeholder participatory training (CABI)

**Subprogram 4. Institutional and individual capacity building**

ASEM/2004/077	Postgraduate scholarship scheme for the University of Technology, Lae, PNG
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## Active projects in Papua New Guinea



# Pacific Island countries

Population	1.9 million	Bilateral actual 2005–06	\$2.16 m
Population 2015/2050	2.2/2.7 million	Bilateral estimate 2006–07	\$2.47 m
Active bilateral projects	29	Bilateral budget 2007–08	\$2.35 m
Active multilateral projects	3	Bilateral + multilateral budget 2007–08	\$2.78 m

GNI per capita (\$US)			
Fiji	3,280	Samoa	2,090
Solomon Islands	590	Tonga	2,190
Vanuatu	1,600		

## Key program managers

*Dr Jeff Davis, Policy Linkages and Impact Assessment*  
*Mr Les Baxter, Horticulture*  
*Mr Barney Smith, Fisheries*  
*Dr Russell Haines, Forestry*  
*Dr Jon Tanner, Livestock Production Systems*  
*(Solomon Islands and Tonga only)*

## Country Manager

*Dr Jacqui Wright, ACIAR Country Manager, PNG and Solomon Islands*



## Key performance indicators (2007–08)

- Demonstrated integration of existing farming systems knowledge and/or adoption of earlier research in at least four Pacific Island projects
- Field testing of promising sustainable management practices and values addition demonstrated in forestry and agroforestry projects
- Fisheries management arrangements enhanced or economic analyses completed in at least two countries
- Demonstrated development and successful field testing of Integrated Crop Management practices for at least two horticultural crops
- Improved agricultural statistics or marketing systems identified, developed and tested in at least two Pacific Island countries
- At least 40% of new projects designed to have significant farmer or policy-maker impacts within five years of completion

## Medium-term strategy

ACIAR's strategy for the Pacific recognises that the agricultural, fisheries and forestry sectors have significant short to medium potential to raise incomes and economic growth to assist in alleviating unemployment and poverty. For agriculture, constraints include lack of infrastructure; the need to improve farmer access to technology and market information; removal of market distortions and facilitating market access through improved quarantine systems. In fisheries, ACIAR will focus on addressing sustainable production of oceanic and coastal fisheries while also

contributing through developing aquaculture alternatives and improving economic returns in terms of quality, marketing and value-adding activities. ACIAR's forestry program in the Pacific will be oriented towards improved community forestry systems, enhanced genetic resources and development of disease and pest detection and control methods. There will be increased attention to improved processing and product development to enhance market returns. In establishing priorities, ACIAR will work with partners to better map wider market opportunities for agricultural, forestry and fisheries products which are inclusive of the range of issues important to rural communities in the Pacific to ensure that the specific research priorities are addressing the most important systematic constraints.

ACIAR's research program in the Pacific will continue to emphasise securing sustainable productivity growth from existing production systems. Potential new niche farm, fisheries and forestry products will also be examined to achieve both diversification and income growth where this is feasible. A concomitant emphasis on adoption of research outputs through capacity building will be maintained. Research to develop the most suitable policy settings to facilitate research uptake will assist in this endeavour in a multidisciplinary approach.

## Position

ACIAR's position in the Pacific Islands will continue to develop in line with broader Australian foreign policy and development assistance priorities. There is an increasing awareness of the importance of changing economic and

environmental situations and the vulnerability of small developing island states if flexibility and adaptation to change is not achieved.

The Pacific Island countries have a range of mutual challenges including eroding tariff preferences; population and urban growth; migration of skilled labour; resource depletion and degradation; and risks from global warming. Discussions at the Second Regional Conference of Heads of Agriculture and Forestry Services in September 2006 also recognised the need for a 'holistic' approach linking agriculture, forestry fisheries and the environment more effectively. As referenced in *Pacific 2020—challenges and opportunities for growth*, ineffective policy implementation is seen as a significant impediment to development and progress.

Agriculture and fisheries will comprise the majority of livelihoods of Pacific Island countries for the foreseeable future. Many smallholders live in isolated rural communities dependent on household food production and intermittent crop, fish and small livestock sales. Improving and transforming these systems into an income-generating activity through improved productivity and marketing will enhance self-reliance and reduce poverty over time.

The development of an agricultural enabling environment (focusing on training, extension, land tenure and development of suitable production systems for primary industry sectors that are often under performing) is an ongoing objective. Participation in regional or multi-country programs and projects that address common problems will help overcome the lack of capacity of many countries to engage in collaborative activities. ACIAR also encourages and contributes to the involvement of International Agricultural Research Centres in the region. ACIAR also has a strong emphasis on working with Pacific Regional Organisations to improve effective delivery of outputs. Over the last four years an increased percentage of the ACIAR budget is being directed towards Melanesian countries in line with Australian regional aid strategies.

### Relationship to the AusAID regional strategy

AusAID's Pacific regional aid strategy 2004–09 identifies four key themes, including: stronger broad-based growth; more effective, accountable and democratic government; improved law, justice and security; and enhanced service delivery. These themes are further underlined in the *Pacific 2020 Report* with a commitment to address governance and institutions, infrastructure, regional cooperation and implementation of programs (which essentially requires local ownership and action, as well as country-level participation to achieve results).

ACIAR's Pacific program contributes to these objectives in a number of ways, primarily in the thematic area of broad-based economic growth. Close partnership with partner

countries and regional organisations in the development and delivery of research projects are intrinsic to ACIAR's operations in the Pacific and elsewhere. This is seen as critical in terms of capacity building and adoption

Specific priorities identified for agriculture, fisheries and forestry under which ACIAR projects will make direct contributions include:

- improving farmer access to technologies and market information through industry led research and extension
- removal of or reduction of internal or regional/global market distortions
- facilitating market access through improved quarantine resources.

### Indicative priorities

ACIAR held its most recent formal program consultations on priorities with representatives of the five bilateral partner countries and key regional organisations in Suva in December 2003. The outcomes of this consultation are available at [www.aciar.gov.au](http://www.aciar.gov.au) under 'Partner country priorities/South Pacific region'. ACIAR also attends the regular regional priority-setting meetings of Pacific government agriculture, forestry and fisheries agencies, including the Second Regional Conference of Heads of Agriculture and Forestry Services (HOAFS) in September 2006. Discussions confirmed the above ACIAR priorities and the importance of attention to genetic resources, biosecurity and human nutrition in projects (where feasible).

Priority areas for future collaboration include:

#### **Subprogram 1: Improving incomes through more productive farming systems**

- Integration of existing knowledge into information packages for bananas and taro
- Facilitating adoption of earlier research on pest, weed and disease management
- New opportunities for inland aquaculture, including the domestication of promising indigenous species, and integration into existing farming systems
- Utilisation of locally available materials to develop cost-effective feed formulations for pigs, poultry and aquaculture species
- Value-adding processing of forest products

#### **Subprogram 2: Sustainable management of forestry and fishery resources**

- Stock status assessment and planning for the sustained use of vulnerable inshore fisheries, with an emphasis on increased community-level management and co-management
- Domestication of multipurpose trees for forestry and agroforestry, including selection of suitable germplasm and silvicultural management
- Sustainable management (and protection from pests

and diseases) of high-value plantations and native forests

- Watershed protection functions and groundwater management in forestry
- Resource valuations and economic analyses of smallholder and commercial fisheries

**Subprogram 3: Biosecurity and pest and disease management**

- Identification of quarantine and pest risk issues for crop germplasm requiring exchange between countries
- Development and adoption of integrated crop management packages (including pest, weed and disease control)
- Regional studies of import risks associated with the movement of live aquatic organisms and the definition of appropriate quarantine strategies

**Subprogram 4: Farming systems economics and marketing**

- Economic and marketing analyses of aquaculture commodities to identify opportunities for production, marketing and processing
- Improved agricultural statistics to develop indicators that measure smallholder contribution to national economies
- Marketing research to help producers and industry identify market opportunities for agricultural commodities
- Economic analysis of farming practices, including organic farming and alternatives to slash-and-burn agriculture
- Economic analysis of returns and certification issues of current and potential crops or commodities
- Analysis of the economic tradeoffs incurred in moving from access-fee arrangements for Distant Water Fishing Nation vessels to domestic allocation of tuna harvests and onshore processing/transshipment requirements

**Current project portfolio**

*(Possible new projects commencing in 2007–08 shown as 'proposed')*

**Subprogram 1: Improving incomes through more productive farming systems**

ADP/2005/140	Participatory needs assessment for capacity building in extension (Pacific Islands)
FIS/2005/108	Freshwater prawn aquaculture in the Pacific: improving culture stock quality and nutrition in Fiji (Fiji)
FIS/2006/126 (proposed)	Developing pond aquaculture for sandfish in Asia–Pacific (Fiji, New Caledonia)
FIS/2006/138 (proposed)	Developing aquaculture-based livelihoods in the Pacific Islands region and northern Australia
FIS/2006/172	Pearl production from the winged pearl oyster, <i>Pteria penguin</i> , in Tonga
FST/2006/048 (proposed)	Improved processing, storage and packaging of Canarium nuts
HORT/2003/046	Integrated control of powdery mildew and other disease, weed and insect problems in squash in Tonga and Australia
HORT/2003/047	Improved plant protection in the Solomon Islands
HORT/2005/077 (Multilateral)	Integrated crop management package for sustainable home gardens in the Solomon Islands (AVRDC)
HORT/2005/134 (Multilateral)	The use of pathogen-tested planting materials to improve sustainable sweet potato production in Solomon Islands and Papua New Guinea (CIP)
HORT/2006/055	Developing the ornamentals industry in the Pacific: an opportunity for income generation (Fiji, PNG)
HORT/2006/106	Screening and field trials of high-carotenoid sweet potatoes for improving the vitamin A status of residents of the Solomon Islands and Papua New Guinea
HORT/2006/108	The potential for tropical fruit production in Tonga: a feasibility and constraints analysis
HORT/2006/173 (proposed)	Sustainable tropical fruit production in Tonga
LPS/2003/054	Feeding village poultry in the Solomon Islands
LPS/2006/149	Feed for poultry and pigs in Tonga

**Subprogram 2: Sustainable management of forestry and fishery resources**

ASEM/2004/011	Evaluating domestic tuna fisheries projects (Solomon Islands, PNG)
FIS/2001/036	Maximising the economic benefits to Pacific Island nations from management of migratory tuna stocks (Pacific)
FIS/2003/051 (Multilateral)	Improving sustainability and profitability of village sea cucumber fisheries in the Solomon Islands (WorldFish)
FST/2002/097	Identification of optimum genetic resources for establishment of local species of sandalwood for plantations and agroforests in Vanuatu and Cape York Peninsula
FST/2003/049	Review of portable sawmills in the Pacific: identifying the factors of success (PNG, Solomon Islands)
FST/2004/054	Improving value and marketability of coconut wood (Fiji, Samoa)

FST/2004/055	Domestication and commercialisation of <i>Canarium indicum</i> in Papua New Guinea
FST/2005/089 (proposed)	Improved silvicultural management of <i>Endospermum medullosum</i> (whitewood) for enhanced plantation forestry outcomes in Vanuatu
FST/2006/118	Sandalwood inventory (Vanuatu)

### **Subprogram 3: Biosecurity and pest and disease management**

CP/2000/044	Taro beetle management in PNG and Fiji
CP/2004/064	Biological control of 'mile-a-minute' ( <i>Mikania micrantha</i> ) in PNG and Fiji
FST/2004/053	Establishing forest pest detection systems in South Pacific countries and Australia (Fiji, Vanuatu)
HORT/2003/046	Integrated control of powdery mildew and other disease, weed and insect problems in squash in Tonga and Australia
HORT/2003/047	Improved plant protection in the Solomon Islands
HORT/2004/030	Control of Asian honeybees in the Solomon Islands
HORT/2004/049	Improved farming systems for managing soil-borne pathogens of ginger in Fiji and Australia
HORT/2004/063	Integrated pest management in a sustainable production system for Brassica crops in Fiji and Samoa
HORT/2006/053	Evaluation of the effects of dasheen mosaic virus on taro yield (Fiji, Samoa)

### **Subprogram 4: Farming systems economics and marketing**

ADP/2002/047	Trade liberalisation, agriculture and land degradation in Fiji: implications for sustainable development policies (Fiji)
ADP/2003/069	Policy options for improving the value of land use in smallholder Fijian agriculture (Fiji)
ASEM/2004/011	Evaluating domestic tuna fisheries projects (PNG, Solomon Islands)
FIS/2001/036	Maximising the economic benefits to Pacific Island nations from management of migratory tuna stocks (Fiji, Kiribati, PNG, Samoa, Solomon Islands, Vanuatu)
FIS/2002/105	Economic and market analysis of the live reef fish food trade in Asia-Pacific (Fiji)
FST/2004/054	Improving value and marketability of coconut wood (Fiji, Samoa)
HORT/2001/023	Horticulture industry development for market-remote communities (Samoa)
HORT/2006/109 (proposed)	Analysis of the constraints to vanilla production in the South Pacific
PLIA/2006/021 (proposed)	Possible policy constraints to policy research in the Pacific

## **Country-specific issues**

Although several of the challenges for agriculture, forestry and fisheries are common to most Pacific nations, and much of the ACIAR program in the Pacific is delivered through regional organisations, we recognise that certain priorities may differ between nations. ACIAR will continue to support a limited number of single-country projects on major issues. A statement on strategy and research opportunities for each of the five Pacific countries with which ACIAR cooperates bilaterally is provided below.

### **Fiji**

Fiji's poverty level is comparatively low, though rural-urban income inequality is an increasing problem. There is a good natural resource base for agriculture, forestry and fisheries. After a period of ACIAR project emphasis on crop and livestock production, crop protection and agricultural economics focuses began more recently. There has also been strong ongoing cooperation in fisheries. Fiji also hosts the main campus of the University of the South Pacific and the bases of the SPC Land Resources Division, the Pacific Forum Secretariat and several relevant NGOs.

Sugar production is decreasing, and the development of alternative land uses for agriculture within a sustainable land management framework is a national imperative. A high priority in ACIAR's program in Fiji is economic and technical research aimed at developing alternative crops

and agricultural industries to sugar and understanding the impact of specific policy changes on Fiji's food production sector (in coordination with other government and donor initiatives). Developments in promising horticultural crops and accompanying postharvest technologies and marketing options are being explored.

Opportunities for research to improve livelihoods in fisheries include: more productive inland farming systems; aquatic health including quarantine and import risk assessment; restocking as a tool to rehabilitate sea cucumber fisheries; improved feed formulations for freshwater finfish and macrobrachium. More research may be needed on marketing fisheries products. Some options for forestry cooperation include timber utilisation, value-adding to mahogany and native species, plantation management and health, and increasing the potential of indigenous forestry species.

## Solomon Islands

The recent civil conflict caused stagnation or collapse in the production and export of many commodities. Fish, timber, copra, palm oil and cocoa were previously substantial exports, along with minerals such as gold. Most Solomon Islanders live in isolated rural communities dependent on subsistence agriculture and intermittent crop and small livestock sales.

ACIAR has a significant number of completed projects in the Solomon Islands, covering culture of a range of coral reef species, marine protected areas, stock assessment and fisheries management policy; farming systems economics; production and diseases of root crops; insect pests; biological control of pests; and forest tree nutrition. ACIAR's Solomon Islands program has had a strong fisheries emphasis, including economic and technical research to support the development of sustainable livelihood opportunities based on the culture of coral reef animals. Much of the latter has been underpinned by partnership with the WorldFish Centre, which maintains an active research facility in the Solomon Islands. This centre was damaged in the 2007 Tsunami, but ACIAR retains its commitment to collaboration with WorldFish in the country. ACIAR has a long-term commitment to cooperation with the Solomon Islands, with this effort strongly focused on activities that will quickly contribute to enhanced smallholder income generation.

The loss of field station and laboratory infrastructure in the national agricultural research system means that we will collaborate in on-farm research and recognise that NGOs play an important role in agricultural service delivery. To this end we will encourage partnerships between national and provincial technical services and key rural NGOs in our projects.

Income generation initiatives, particularly in rural areas, remain important in the broader scheme of economic and social recovery in the Solomon Islands, and much of this necessarily needs to be in agriculture, forestry and fisheries. ACIAR will explore opportunities for specific linkages with AusAID's Transitional Support for Agriculture Program and subsequent initiatives as they come into operation, and will interact with the World Bank and European Union in their preparation of an Agriculture and Rural Development Strategy for the Solomon Islands.

## Vanuatu

Vanuatu's agriculture sector (along with tourism) remains the main focus of the country's development strategy. The main activities relate to coconut, cattle, cocoa, and timber production, with traditional food production for subsistence and local markets. Smallholders also cultivate peanuts, potatoes, vanilla and pepper. Although Vanuatu is an agricultural exporter, the majority of the population is in the subsistence or informal sector.

ACIAR's past program in Vanuatu has emphasised fisheries, crop sciences and forestry. The major partner for bilateral cooperation in Vanuatu is the Ministry of Agriculture, Quarantine, Forestry, and Fisheries (MAQFF)—although some strong farmers' associations exist, and linkages with the French Agricultural Research Centre for International Development (CIRAD) and the private sector also provide opportunities.

With horticultural crops, market analysis of crop commodities is required to identify suitable niche markets for Vanuatu. Crop protection and postharvest technology research to underpin development of horticultural export markets, and assistance with work on efficacy of fruit fly baits and on management of fruit piercing moth, may also be required. We will ensure that earlier ACIAR support for research on regional root crops such as taro, yam and sweet potato is extended, through production of field guides and other extension material.

Targeted research to underpin village-level fisheries (including aquaculture) as well as commercial fisheries is also required. Livestock research may be more important in Vanuatu than elsewhere in the Pacific Islands. Forest covers almost 40% of the total land area of Vanuatu, and policy and technical interventions for sustainable management of plantations and development of new species of commercial value for both plantations and smallholders are important. In forestry, assistance is needed in relation to assessing commercial prospects for native species, including sandalwood and *Canarium*, and controlling the *Merremia* vine.

## Samoa

Samoa has recently had comparatively strong economic growth across a range of sectors, including agriculture. The Ministry of Agriculture and Fisheries has several research stations and experimental farms. Samoa is also the agriculture base of the University of the South Pacific, the Food and Agriculture Organisation of the United Nations (FAO) Subregional Program and the South Pacific Regional Environmental Program (SPREP).

There has been a strong emphasis in the ACIAR program on insect pest management (fruit flies, fruit piercing moth, whitefly and aphids), virus indexing of taro as well as biological control of pests and weeds. Projects undertaken have studied forest nutrition and health as well as fisheries.

Samoa has expertise in germplasm selection of root crops and fruits and in techniques of tissue culture propagation. Research opportunities include those that underpin the development of exports of high-value horticultural products. This may require postharvest research to improve shelf life and transport to boost fruit exports and simple processing/value-addition of fruit tree and root crops. Research to assist improvements in niche marketing of commodities, potentially including organic produce, is of importance.

This may include identification of alternative extension and information transfer technologies.

In forestry, research opportunities may exist in the following areas: policy incentives for establishment of woodlots; nursery management techniques; forest weeds, pests and diseases; and better utilisation of timbers. Increasing wood yields from sawmilling is a high priority as there is currently significant wastage. In fisheries, opportunities may include research on community-based approaches to the management of reef fisheries and technical interventions to underpin the development of village aquaculture industries.

### Tonga

Factors affecting agricultural development include geographical isolation, fluctuations in export markets for Tongan produce, a limited natural resources base and governance structures. Tonga has high natural disaster susceptibility and limited income-generating opportunities for outer islanders.

ACIAR's past program in Tonga has included many disciplines. For crop-related research, future support is likely to be in the area of marketing and postharvest quality improvement.

Farming systems is a current emphasis. Development of markets is an ongoing challenge. Areas of research emphasis in Tonga include productivity of fruits, root crops and vegetables, development of new crops such as coffee and spices, and development of capacity in postharvest technology. Crop protection including fruit fly management is still important, as is better soil and water management for agriculture and other uses. Development of agroforestry-based farming systems (including tree legumes and fruit trees) is a priority, and is the main focus in forestry, since plantation resources are modest.

Tuna is the main fishery export from Tonga and, together with snapper and aquarium fish, is a major export income source. Research will continue into the development of aquaculture systems for commercially important reef species (e.g. hatchery production of winged oyster).



*Solomon Island children*

## Active projects in the Pacific

