

Papua New Guinea and Pacific Island countries

Papua New Guinea
Pacific Island Countries

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ACIAR Regional Coordinators



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Silviculture management trials in Vanuatu

Papua New Guinea

GDP per capita (PPP ^a US\$) ^a	2,563	Bilateral actual 2006–07	\$4.8 m
Population (millions) ^b	6	Bilateral estimate 2007–08	\$4.5 m
Projected population (millions) 2015 ^b	7	Bilateral budget 2008–09	\$5.0 m
Active bilateral projects ^c	34	Bilateral + multilateral budget 2008–09	\$4.9 m
Active multilateral projects ^d	5		

^aPurchasing power parity (see Appendix 3: Selected world development indicators)

^bSource and also for following chapters: United Nations Development Programme, Human Development Report 2007–08, http://hdr.undp.org/en/media/hdr_20072008_en-complete.pdf

^cFor all country chapters this figure indicates active bilateral projects as at July 2007

^dFor all country chapters this figure indicates active multilateral projects as at July 2007

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

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Dr Russell Haines, Forestry

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Medium-term strategy

The ACIAR program aims through applied technical, social, economic and policy research to achieve practical impacts for PNG smallholders, consumers, industry and government. To achieve these goals, ACIAR facilitates and supports research and development activities for efficient use of sustainable resources for more productive and sustainable agricultural systems. 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. PNG has several significant competitive advantages in relation to the production of timber. The opportunity exists to develop a timber growing and processing industry many times larger than the current log export industry from primary forests.

The ACIAR program includes tightly linked clusters of projects addressing problems faced by major commodities such as sweet potato, coffee, oil palm and cocoa. Program design also encourages private sector, industry and NGO linkages in design and delivery of activities. Through addressing issues of biosecurity and sustainable management of land, forest and fisheries resources, sustainability of renewable resources is encouraged. The program has a strong emphasis on capacity

building, with high priority given to both training within projects and postgraduate training. In addition to the project expenditures shown above, between \$ 1–1.5 m is invested by ACIAR annually on training in PNG.

AusAID and ACIAR work closely together in Papua New Guinea. AusAID co-invests into ACIAR-managed project activities, while ACIAR works closely with relevant AusAID programs, particularly the Agricultural Research and Development Support Facility.

Key performance indicators (2008–09)

- social, cultural and technical constraints to increasing smallholder productivity and income in the oil palm and cocoa sectors identified, and promising technologies disseminated
- introduction of high-value species to smallholders in for efficient and sustainable production of timber in forestry and agroforestry systems in at least one province
- development and dissemination of improved feeding strategies and completion of training programs to increase farmer skills in pond husbandry in village-based aquaculture at least two districts
- initial strategies developed to reduce threat of coffee berry borer and impact of cocoa pod borer on smallholder farmers
- technologies developed to increase sweet potato crop yield through appropriate management of soil and nutrients
- direct linkages between at least three AusAID-funded ARDSF projects and ACIAR research outputs
- 40% of new projects designed to have significant farmer or policymaker impacts within 5 years of completion

Position

PNG is one of Australia's most important development partners, and ACIAR's program in PNG reflects this. ACIAR's program recognises the many challenges to agricultural development in PNG, including poorly developed infrastructure, weak market signals and services, pressure on land and renewable resources as a result of population increases and new pest and disease threats, and poor product quality. Future impacts of population pressure and of HIV/AIDS and other human diseases on the farming sector, including effects on labour availability and productivity, will be addressed and gender issues will be mainstreamed into the program. Recognising the enormous potential of agriculture for sustaining the basic livelihood of the people, the Papua New Guinea Department of Agriculture and Livestock has developed a National Agriculture Development Plan as a blueprint to guide future directions in agriculture and rural development.

Village-based agriculture supports over 70% 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, the dominant staple for over 65% of the rural population. The main export tree commodities are timber, oil palm, coffee, cocoa and coconuts. Forestry is PNG's third largest revenue earner and a major contributor to economic and social development. 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 PNG. 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. Where relevant, close linkages will be formed between ACIAR-funded programs in PNG and the Pacific Islands, for example in root and tree crops, fisheries and forestry.

Key principles in designing and executing the program include the importance of engagement with the private sector, industry bodies and NGOs along with government in both research and implementation of research results; the importance of research that assists the engagement of smallholders in the cash economy; and the importance of understanding social and economic issues affecting farmer decision making and factors influencing adoption of new technologies. Research is urgently needed into more effective ways of up-scaling the adoption of R&D results from pilot level involvement of communities to enable broader implementation. ACIAR will work with counterparts to assist in communication and extension of the results of research. 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.

There is particular need to develop the informal sector (including those involved in village level production and marketing of root and horticultural crops, small livestock), improve the productivity of major tree crops (increase production and exports, lower production costs), and to support research and development that assists in diversification of the agricultural export product base.

There are requirements for capacity building at the individual and institutional level in all areas, but particularly to support analyses of social and economic constraints and opportunities, marketing and value addition of agricultural products and in agricultural education. PNG's relative lack of resources and expertise is a constraint in R&D activities and delivery of extension services. It is therefore crucial during design and implementation of projects to involve farmers and extension workers, and to include training and packaging of research results in a form useful to farmers, members of industry and policymakers.

Relationship to the AusAID PNG strategy

AusAID's PNG program supports the Government of Papua New Guinea's medium-term development strategy focus on sustainable broad-based economic growth for the country. It does this by working with PNG government agencies and systems to ensure better use of the country's own resources, leading to stronger economic management, better delivery of essential services, and improved 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 2008–09 the program focus 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 supports better use of PNG's own resources. With more than 85% of the population in rural areas, development of agricultural industries and the smallholder cash economy will be critical to achieving broad-based economic growth and improving rural livelihoods in PNG.

Research priorities

ACIAR has a formal program of consultations with PNG to establish priorities in research collaboration, as well as annual smaller consultations and industry workshops to finetune these priorities. A record of the most recent set of formal consultations, held in May 2008, is provided at <www.aciar.gov.au> under *Partner country priorities / Papua New Guinea*. The ACIAR PNG portfolio emphasises the disciplines of agricultural systems (including postharvest activities), production and protection of root, horticultural and tree crops, fisheries and forestry. Training priorities are mainly addressed through targeted activities within projects, although support for postgraduate degrees in Australia and an in-country scholarship scheme at the University of Technology, Lae, are the main contributors to capacity development. The priorities are grouped under the following thematic programs.

Subprogram 1: Addressing social, cultural and policy constraints to the adoption of agricultural technologies

- Interventions to overcome cross-cutting social and cultural constraints to smallholder household profitability/ productivity based on analysis of:
 - Land mobilisation issues (tenure, registration, titles, communal)
 - Applicability of new labour mobilisation models beyond the cocoa and oil palm industries
 - Impact of smallholder involvement in participatory action research activities and other adult/group learning processes on adoption of technical innovations
 - Effects of cultural factors on ability to replicate successful entrepreneurship in agriculture
 - Analysis of income utilisation, savings incentives and microfinance access in smallholder families, particularly with respect to establishing criteria for successful engagement of women
- Analysis of how current production and marketing systems impact on women (labour, timing, marketing) in terms of efficiency and equity, and the role and effectiveness of womens' groups in agriculture and rural industries
- Role of cottage industries in contribution to livelihoods, household cash flow and complementing engagement in formal markets and the national economy
- Economic assessment of rice trade and rice-based farming systems, including national demand (role of production and imports) and potential returns from investing in technical improvements
- Improved crop water management under climate variability and change including:
 - management of water availability (including through low-cost irrigation) to meet market demand and food security
 - identification of drought-vulnerable areas for PNG and potential policy and technical interventions

Subprogram 2: Enhancement of smallholder incomes from horticulture and root crops

- Matching supply to demand and marketing of highland root and horticultural crops:
 - Understanding the sector to clarify demand of different product categories (fresh, processed, selected export) in major markets
 - Understanding relative effectiveness of different collaborative arrangements for mobilising smallholders (e.g. 'clustering' farmers versus using co-operatives) from social and cultural perspectives
 - Economics of storage depots, role of private sector versus government intervention.
 - Establishment of criteria for productive relationships between smallholders, middlemen and private sector buyers and sellers
- Application of traditional staple crop varieties (sweet potato, taro and banana) and identification of suitable potato and other root crop varieties for village-level and commercially-processed products
- Identification of quarantine barriers for potential export of root crops and flowers to other countries
- Use of legumes and fallow crops for soil fertility improvement and longer term nutrient supply in vegetable production systems
- Analysis and interventions in market chains for key temperate vegetables, including collation of market information and strategies to improve post-harvest operations.
- Assessment of simple technologies and mechanisation systems for family and community production, postharvest handling and storage of horticultural crops
- Improvement of seed multiplication, distribution and marketing systems, including assessment of strategies for enhancing availability of quality seed
- Improved productivity and profitability of sweet potato based farming systems, including:
 - development of breeding and selection strategies for important traits in sweet potato for different regions (lowlands, highlands, higher altitude) including yield, stress tolerance (salinity, excess moisture, drought tolerance) and consumer preferences (colour, taste, texture)
 - development of integrated pest, disease, weed and nutrient management strategies
 - evaluation of industrial opportunities for processed sweet potato products
- Identification of promising root crop - legume - tree - livestock systems that provide better use of crop residues for nutrient cycling and local sources of animal feed

Subprogram 3: Improving smallholder returns from export tree crop production and marketing

- Social and economic analysis of incentives for uptake of intensified management systems (fertilizer, pests,

- disease and plantation management) in cocoa, coffee and oil palm (including reinvestment of income)
 - Development and application of GIS database for coffee, cocoa and oil palm with a focus on management of pest and disease outbreaks
 - Impact of cocoa pod borer infestation and of potential coffee berry borer infestation with respect to socio-economic impacts on smallholders and implementation of pre-border, post border spread, incursion management, and surveillance
 - Development and smallholder implementation of biocontrol systems for major oil palm pests (sexava, eurycantha) and diseases (ganoderma)
 - Assessment of natural resource sustainability indicators for tree crop industries
 - Management systems for processing wastes for coffee and other tree crops to underpin development of environmentally sustainable production practices required for certain export markets
- ACIAR collaboration with whole-of-government programs)
 - Reforestation strategies for rehabilitation of degraded areas, including secondary (cutover) forests, mine sites and grasslands
 - Management of shark fisheries, including target (shark longline) and non-target (tuna purse seine and longline) fisheries
 - Responding to overfished inshore fisheries through community based fisheries management, restocking (especially of sea cucumber) and identification of aquaculture-based livelihoods
 - Assessment of future risks, control and potential utilisation strategies for invasive or exotic fisheries species (e.g. snake head, climbing perch)
 - Strengthening of surveillance systems to monitor and respond to livestock diseases

Subprogram 4: New livelihoods from smallholder fisheries, aquaculture and forestry

- GIS based tools that integrate aquaculture into existing land use systems and socio-economic contexts
- Small-scale inland aquaculture, including cost-effective feeds and feeding strategies, and increased availability of quality fingerlings
- Evaluation of livelihood opportunities in recreational fishing resources such as black bass
- Development of agroforestry systems, addressing:
 - Integration of high value tree crops into agricultural systems, particularly involving rubber in the Western Province and in contour terraces in the highlands
 - Germplasm development, delivery and conduct of agroforestry demonstration sites
 - Social, cultural and economic motivation for landowners planting trees
- Social and economic approaches to improve PNG smallholder involvement in forestry and agroforestry, addressing socio-economic mapping, land tenure and user rights issues, participatory processes to foster community engagement
- Improving economic returns from timber processing, including analysis of economic analysis of sawmilling strategies, improving sawn log recovery and utilisation of small diameter logs from secondary forests

Subprogram 5: Agricultural biosecurity and sustainable management of forestry and fisheries resources

- Optimising economic, social and environmental returns from planted and native forests, particularly addressing landowner land use options, product diversification and income earning opportunities for women
- Climate change and sustainable forest management, including research on transparent instruments to foster landowner involvement in carbon trading (through



Improving fingerling supply and fish nutrition for smallholder farms involved in inland aquaculture in PNG

Current project portfolio

(Possible new projects commencing in 2008–09 shown as 'proposed')

Subprogram 1: Addressing social, cultural and policy constraints to the adoption of agricultural technologies

ASEM/2004/011	Evaluating domestic tuna fisheries projects
ASEM/2004/077	Postgraduate scholarship scheme for the University of Technology, Lae, PNG
ASEM/2005/094	Improving the profitability of village broiler production in PNG
ASEM/2006/023	Re-commercialisation of the PNG pyrethrum industry and improving harvested yields in Australia
ASEM/2006/129	Early warning and drought preparedness for improved management of crop production in Papua New Guinea
PLIA/2005/149 (proposed)	A comparison of policy environments for cocoa technology adoption and industry development in Bougainville and other parts of PNG
PLIA/2006/004 (proposed)	Road improvement in PNG and implications for adoption of research outcomes for coffee growers
PLIA/2007/096	Review of technology adoption for all ACIAR projects in PNG and case studies of policy and economic factors constraining impacts
SMCN/2004/041	Productivity and marketing enhancement for peanut in Papua New Guinea and Australia

Subprogram 2: Enhancement of smallholder incomes from horticulture and root crops

Root crops are traditional staple foods in PNG, and their vital contribution to food security in PNG is well recognised. However, the production of root crops, in particular sweet potato, is declining as a consequence of competing land pressure, shortening fallow periods, soil degradation and other factors such as pests and diseases. The ACIAR project cluster on root crops is designed with these constraints in mind. Its main focus is on identification and development of more productive and sustainable production systems based on root crops. Activities include efficient use of plant genetic resources; identification of promising nutrient, water, pest and disease management practices; and development of improved postharvest handling techniques. Capacity building and dissemination of promising technologies to farmers are critical and integral components of the program. During 2008/09 a program of activities on horticultural crops will be developed.

ASEM/2006/035	Improving marketing efficiency and postharvest handling of sweet potatoes in PNG
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 PNG (CIP)

HORT/2006/106	Screening and field trials of high-carotenoid sweet potatoes for improving the vitamin A status of residents of Solomon Islands and Papua New Guinea
SMCN/2003/010	Farmer evaluation and multiplication of sweet potato varieties on the northern coast of PNG
SMCN/2004/067	Management of soil fertility in sweet potato-based cropping systems of the PNG Highlands

Subprogram 3: Improving smallholder returns from export tree crop production and marketing

Cocoa and oil palm. The scope for smallholder productivity and income improvements within the export tree sector is large in PNG. There are approximately 150,000 families producing cocoa at very low levels of productivity, and over 18,000 smallholder growers producing oil palm at less than 50% of plantation capacity.

If productivity were to rise by even a small margin, the income gains would be significant for smallholders, their families and their communities. This can only be achieved through improvements in smallholder crop husbandry skills, application of fertiliser and management of soil fertility. The main aim of this cluster of projects is to raise smallholder productivity and incomes in the oil palm and cocoa sectors. This will be achieved through identification of promising management practices to overcome common nutrient deficiencies that limit yields, and promotion of effective strategies for commercial sector partnerships with smallholders.

ASEM/2003/015	Enhancing PNG smallholder cocoa production through greater adoption of disease control practices
ASEM/2006/127	Private sector / smallholder partnerships for improving incomes in oil palm and cocoa sectors in Papua New Guinea
CP/2007/098	Development of a mycoinsecticide to control Sexava pests in oil palm

Coffee. The PNG coffee industry supports over 350,000 families and earns K300 million (\$A120 million) annually, but the consistency and reliability of coffee supply and quality has declined with the move to low-input management of the smallholder industry. Despite this general decline, premium PNG coffee retains a good reputation among customers and there is good scope to increase demand by improving marketing and quality. ACIAR's coffee program cluster aims to increase the profitability of coffee production for smallholders through optimising the cost and adequacy of production inputs, improving reliability of supply and quality, processing for quality and exploring a range of alternative marketing approaches.

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 scales in Papua New Guinea (CABI)

Subprogram 4: New livelihoods from smallholder fisheries, aquaculture and forestry

Fisheries and aquaculture. Inland fish farming is expanding rapidly in PNG, with an estimated 11,000 smallholder farmers contributing an annual production valued at \$A2.5 million. Key constraints include poor fingerling supply compounded by inefficient distribution channels (which limit the availability of seed to farmers), the high cost and limited availability of suitable feeds, and a general lack of aquaculture husbandry skills and knowledge.

The projects are interlinked and collectively aim to improve the productivity of fish farmers in inland PNG in the following ways: by increasing the supply of fingerlings to farmers; improving available feeding options, including on-farm feed production and the development and distribution of simple formulated feeds based on locally available materials; conducting dedicated training programs and strategies to increase farmer skills in pond husbandry; and investigating alternative culture species, with an emphasis on promising indigenous fish and crustaceans.

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/2006/138	Developing aquaculture-based livelihoods in the Pacific islands region and northern Australia

Forestry and agroforestry. ACIAR's PNG forestry project cluster promotes the development of a smallholder and community-based plantation industry with high-value species. This would be based on significant domestic processing, involving both portable sawmills and static production facilities, together with enhanced production of non-timber forest products and services. In conjunction with this research, there is support to improve management of secondary forests for the ongoing sustainable production of timber.

FST/2004/050	Value-adding to PNG agroforestry systems
FST/2004/055	Domestication and commercialisation of <i>Canarium indicum</i> in Papua New Guinea
FST/2006/088	Promoting diverse fuel wood production systems in PNG
FST/2006/120	Increasing downstream value-adding in PNG's forest and wood products industry

FST/2007/078 (proposed)	Germplasm development and delivery to underpin a PNG timber industry based on planted forests
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Subprogram 5: Agricultural biosecurity and sustainable management of forestry and fisheries resources

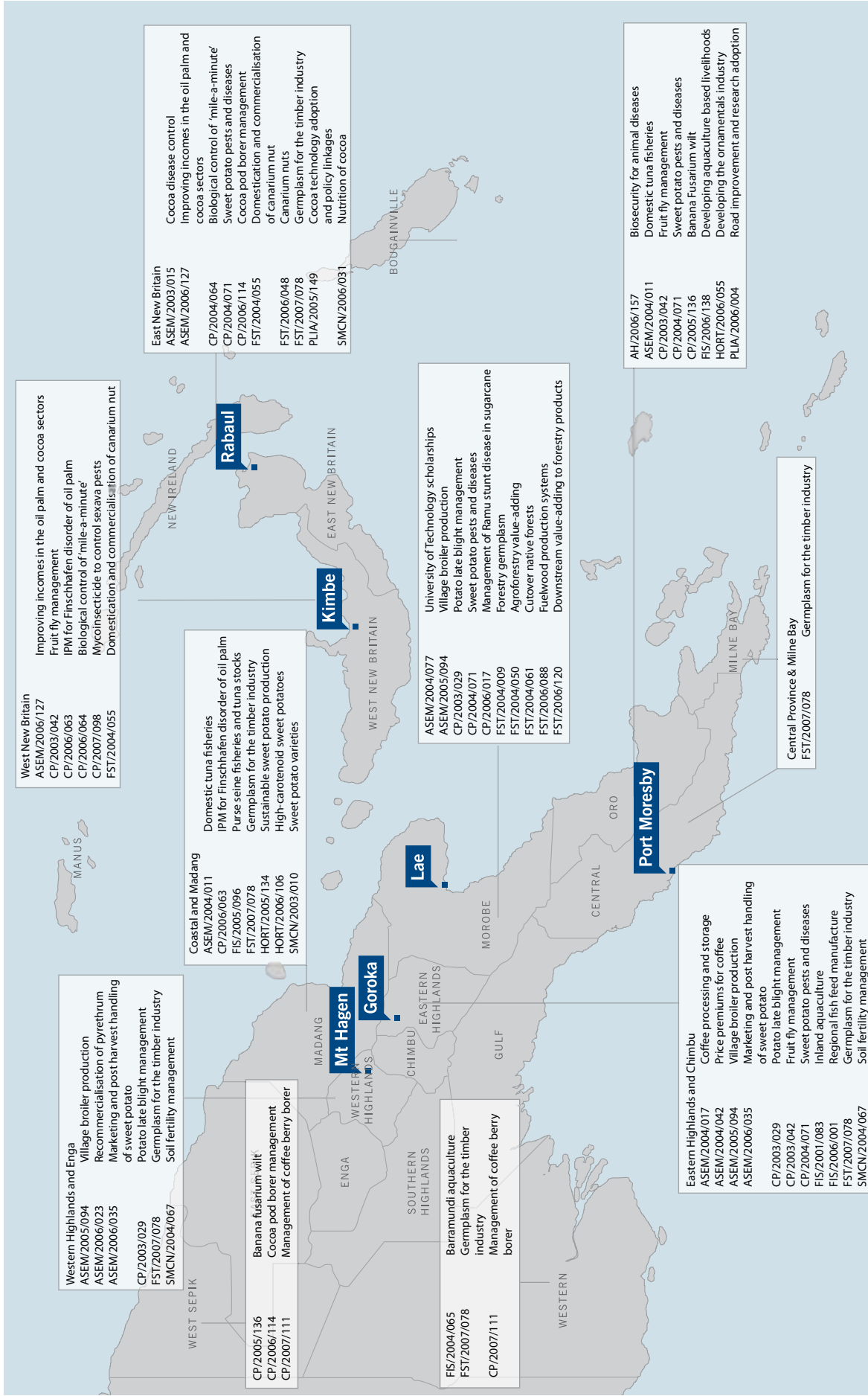
Biosecurity Many of the agricultural pests and diseases that ravage staple food crops, plantation and horticultural crops in PNG are of biosecurity concern to Australia. ACIAR has a cluster of projects that investigate better ways to manage these pests and diseases using systematic and environmentally sound methods. These include integrated pest/disease management techniques and biological control options, some of which are focused on pest/disease surveillance, quarantine risk and incursion management. The projects aim to reduce crop losses and increase quality and productivity, providing better incomes for farmers. All projects have capacity-enhancement components.

AH/2006/157	Improved biosecurity for animal diseases in Papua New Guinea
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 <i>Fusarium</i> 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/2004/064	Biological control of 'mile-a-minute' (<i>Mikania micrantha</i>) in PNG, Fiji and Australia
CP/2006/114 (multilateral)	Managing cocoa pod borer in PNG through improved risk incursion management capabilities, IPM strategies and stakeholder participatory training (CABI)
CP 2007/111 (multilateral)	Incursion prevention and management of coffee berry borer in Papua New Guinea and East Indonesia (CABI)

Sustainable resource management

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/2004/061	Assessment, management and marketing of goods and services from cutover native forests in PNG forests

Active projects in Papua New Guinea



Pacific Island countries

Population (millions)	2	Bilateral actual 2006–07	\$2.7 m
Projected population (millions) 2015	2	Bilateral estimate 2007–08	\$2.8 m
Active bilateral projects	26	Bilateral budget 2008–09	\$2.4 m
Active multilateral projects	3	Bilateral + multilateral budget 2008–09	\$3.0 m

GDP per capita (PPP ^a US\$)			
Fiji	6,049	Samoa	6,170
Solomon Islands	2,031	Tonga	8,177
Vanuatu	3,225		

^aPurchasing power parity (see Appendix 3, Selected world development indicators)



Vegetable trials at the Don Bosco rural training centre Honiara Plains, Solomon Islands

Medium-term strategy

ACIAR's program in the Pacific islands countries concentrates on Fiji, Solomon Islands, Samoa, Tonga and Vanuatu. Our strategy recognises the importance of the agricultural, fisheries and forestry sectors within these countries. It supports research, capacity building and adoption of the results of previous research to underpin increases in household income and economic growth, and assist with the reduction of unemployment and improvement in food security. The strategy supports research to address three thrusts: increased productivity and diversification through new crops, products and value-adding; development of sustainable forestry and fisheries management systems; underpinning of marketing and biosecurity.

In agriculture, the program will focus on identification and management of constraints to productivity in high-value crops, and identification and development of new high-value horticultural crops (fruits, vegetables and ornamentals) for domestic and inter-island markets. In fisheries, ACIAR will focus on addressing sustainable production of oceanic and inshore fisheries, and on development of aquaculture alternatives and improvements in economic returns in quality, marketing and value-adding activities. The forestry program will focus on development of emerging plantation opportunities through improved silviculture management, 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. Farming systems and marketing research will be undertaken to underpin the strategy. This will include analysis of activities in trade liberalisation, policy and constraints; and of new opportunities and markets. The program also has a strong emphasis on building research and development capacity within the region.

Key performance indicators (2008–09)

- research program implemented that underpins emerging high-value forestry plantation programs for teak, whitewood and sandalwood
- projects developing new fruit crop opportunities for Tonga and new vegetable opportunities for Solomon Islands implemented
- improvements in aquaculture-based livelihoods investigated through a mini-project approach in at least three countries
- ACIAR–USP scholarship scheme implemented with at least five students placed within active ACIAR projects
- preliminary policy environment implications ready for adoption from an assessment of all ACIAR projects in the Pacific
- 40% of new projects designed to have significant farmer or policymaker impacts within 5 years of completion

Position

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

Key program managers

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Mr Barney Smith, Fisheries

Dr Russell Haines, Forestry

Country Manager

Dr Jacqui Wright, ACIAR Country Manager,

PNG and Solomon Islands

situations, and the vulnerability of small developing island states if flexibility and adaptation to change are not achieved. The Pacific islands countries have a range of challenges including eroding tariff preferences, population and urban growth, migration of skilled labour, resource depletion and degradation, and risks from climate change. As described in *Pacific 2020—challenges and opportunities for growth* (<www.usaid.gov/publications/pdf/pacific2020.pdf>), ineffective policy implementation is seen as a significant impediment to development and progress.

Agriculture, forestry and fisheries sustain many households and will comprise the majority of livelihoods of Pacific islands 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 sustainable income-generating activities through improved productivity and marketing will enhance self-reliance and reduce poverty over time, as will diversification into new activities.

The development of an agriculture-enabling environment is an ongoing objective. Participation in regional projects that address common problems, where appropriate, will help overcome the limited capacity of many countries to engage in collaborative activities. ACIAR has a strong emphasis on working with Pacific regional organisations to improve effective delivery of outputs. In partnership with the University of the South Pacific, ACIAR will implement a scholarships program designed to increase capacity in the region through the allocation of Postgraduate Diploma and Masters Degree scholarships for research associated with ACIAR projects in the Pacific.

Relationship to the AusAID regional strategy

AusAID's Pacific Regional Aid Strategy 2004–09 identifies four key themes: 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.

ACIAR's Pacific program, through its three research emphases (increased productivity and diversification through new crops, products and value-adding; development of sustainable management systems; underpinning of systems development, economics, marketing and biosecurity), contributes to these objectives primarily in the thematic area of broad-based economic growth. In fisheries, ACIAR will work in cooperation with AusAID's new Pacific fisheries strategy developed in 2007.

Research priorities

Priorities for ACIAR – Pacific islands country cooperation are continually reviewed and updated in regular consultation

with relevant government, community and private sector stakeholders. ACIAR also attends the regular regional priority-setting meetings of Pacific government agriculture, forestry and fisheries agencies, including the Regional Conference of Heads of Agriculture and Forestry Services meetings.

New projects will be considered in the areas of agriculture, forestry and fisheries under the following three thematic programs.

Subprogram 1: Improving household incomes and food security through more productive and diverse farming systems

- Integration of existing knowledge into information packages for fruit and vegetable crops
- Development and adoption of integrated production management packages for fruit, vegetable and plantation crops
- Identification, development and adoption of new market-driven opportunities for horticultural crops
- Use of locally available materials to develop cost-effective feed formulations for pigs, poultry and aquaculture species

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

- Sustainable use of the region's valuable fisheries resources, with an emphasis on increased community participation and co-management of inshore fisheries
- Stock status assessment and planning for the sustainable use of vulnerable inshore fisheries, with an emphasis on increased community-level management and co-management
- Introduction of new opportunities for inland aquaculture, including the domestication of promising indigenous species and integration into existing farming systems
- Valuation of resources and economic analysis of smallholder and commercial fisheries
- Domestication of multipurpose trees for forestry and agroforestry, including selection of suitable germplasm and silvicultural management
- Value-adding processing of forest products
- Sustainable management (and protection from pests and diseases) of high-value plantations and native forests

Subprogram 3: Farming systems economics, marketing and biosecurity

- Improvement in agricultural statistics recording to develop indicators that measure smallholder contribution to national economies
- Use of marketing research to help producers and industry identify market opportunities for agricultural commodities
- Economic analysis of returns and certification issues of current and potential crops or commodities

- Facilitation of adoption of earlier research on pest, weed and disease management
- Identification of quarantine and pest risk issues for crop germplasm requiring exchange between countries
- Development and adoption of quarantine pest and disease control measures for crop exports
- Undertaking of regional studies of import risks associated with the movement of live aquatic organisms, and definition of appropriate quarantine strategies

Current project portfolio

(Possible new projects commencing in 2008–09 shown as 'proposed')

Subprogram 1: Improving household incomes and food security through more productive and diverse farming systems

This subprogram has two emphases. First, it aims to develop and implement strategies to underpin sustainable production and improved quality with a particular emphasis on management of crop pests and diseases. The second emphasis is market-driven diversification of production through exploitation of new market niches, genetic diversity, new products and value-adding. Many of these projects focus on the integration and adoption of results from previous adaptive research. The focal industry is horticulture, with a particular emphasis on vegetables and root crops. Some targeted activities in Solomon Islands and Tonga complement earlier successful work in Papua New Guinea on the use of local feeds for poultry and pig production.

CP/2004/064	Biological control of 'mile-a-minute' (<i>Mikania micrantha</i>) in PNG and Fiji
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 Solomon Islands
HORT/2004/030	Control of Asian honeybees in 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 <i>Brassica</i> crops in Fiji and Samoa
HORT/2005/077 (multilateral)	Integrated crop management package for sustainable home gardens in 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/2006/053	Evaluation of the effects of dasheen mosaic virus on taro yield (Fiji, Samoa)
HORT/2006/106	Screening and field trials of high-carotenoid sweet potatoes for improving the vitamin A status of residents of Solomon Islands and Papua New Guinea
HORT/2006/173	Sustainable tropical fruit production in Tonga
HORT/2007/039 (proposed)	The control of basal stem rot of oil palm caused by <i>Ganoderma</i> in Solomon Islands

HORT/2007/118 (proposed)	Alternative disinfestation treatments for fresh produce commodities from Pacific islands countries (Fiji, PNG)
HORT/2008/003	Development of integrated crop production management systems in red papaya in Fiji
LPS/2003/054	Feeding village poultry in Solomon Islands
LPS/2006/149	Feed for poultry and pigs in Tonga

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

This subprogram aims at developing and implementing strategies to sustainably use and manage natural resources associated with forestry and fisheries production. These are often community-owned and publicly managed resources which require broad-based and inclusive management strategies, while at the same time recognising that forestry and fisheries provide significant sources of income.

The Pacific fisheries project cluster has an increased emphasis on freshwater aquaculture and mariculture of sedentary species which provide greater opportunity for income generation at the local level.

FIS/2003/051 (multilateral)	Improving sustainability and profitability of village sea cucumber fisheries in Solomon Islands (WorldFish)
FIS/2005/108	Freshwater prawn aquaculture in the Pacific: improving culture stock quality and nutrition in Fiji
FIS/2006/126 (proposed)	Developing pond aquaculture for sandfish in Asia-Pacific (Fiji)
FIS/2006/138	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

The Pacific forestry project cluster underpins the development of emerging industry opportunities, in particular plantation programs with teak, sandalwood, whitewood and *Flueggea*, while identifying processing opportunities for coconut wood and non-timber forest products.

FST/2004/053	Establishing forest pest detection systems in South Pacific countries and Australia (Fiji, Vanuatu)
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 (and Solomon Islands)
FST/2005/089	Improved silvicultural management of <i>Endospermum medullosum</i> (whitewood) for enhanced plantation forestry outcomes in Vanuatu
FST/2006/048	Improved processing, storage and packaging of <i>Canarium</i> nuts (PNG, Solomon Islands, Vanuatu)
FST/2007/020	Improving silvicultural and economic outcomes from community teak and rosewood plantations in Solomon Islands by interplanting with <i>Flueggea flexuosa</i> and other Pacific agroforestry species

Subprogram 3: Farming systems economics, marketing and biosecurity

This cluster of projects comprises a range of targeted policy and market analysis activities and a capacity-building program designed to underpin subprograms 1 and 2, or to provide analysis and policy support to help Pacific islands governments deal with specific issues.

ASEM/2004/011	Evaluating domestic tuna fisheries projects (PNG, Solomon Islands)
FST/2004/054	Improving value and marketability of coconut wood (Fiji, Samoa)
HORT/2007/072	Postgraduate scholarship scheme for University of the South Pacific (Fiji, Samoa, Solomon Islands, Tonga, Vanuatu)

Country-specific issues

Although many of the challenges for agriculture, forestry and fisheries are common to most Pacific nations, it is recognised that specific priorities may differ between nations. ACIAR will support targeted and mutually agreed single-country projects on major issues of concern. Indicative priority areas and research opportunities for each of the five Pacific countries with which ACIAR cooperates are provided below.

Fiji

Fiji's poverty level is comparatively low although rural–urban income inequality is an increasing problem. ACIAR project emphasis has shifted from crop and livestock production to horticulture, aquaculture and agricultural economics. There has been strong ongoing cooperation in fisheries, particularly in aquaculture.

A high priority in ACIAR's program in Fiji is economic and technical research aimed at developing crop and agricultural industry alternatives to sugar and, in coordination with other government and donor initiatives, understanding the impact of specific policy changes on Fiji's food production sector. Developments in promising horticultural crops and accompanying postharvest technologies and marketing options are being explored. A major thrust of ACIAR work in Fiji's horticulture sector is capacity building in research and development.

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, and improved feed formulations for freshwater finfish and *Macrobrachium*. More research may be needed on the marketing of fisheries products. Some options for forestry cooperation include timber use, 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. Opportunities exist for ACIAR to participate in activities designed to resuscitate and redevelop export industries such as oil palm. Most Solomon Islanders live in isolated rural communities dependent on subsistence agriculture and intermittent crop and small livestock sales, although many also have access to more lucrative urban markets.

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. Income generation initiatives, particularly in rural areas, remain important in the broader scheme of economic and social recovery in Solomon Islands, and much of this necessarily needs to be in horticulture, forestry and fisheries. There are opportunities for smallholders to exploit lucrative market niches for high-value horticultural crops, value-added products and other diversified products, particularly in the developing urban markets. Widespread community interest in the planting of teak offers a development opportunity that is highly suited to ACIAR intervention. ACIAR will continue to develop further 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 as they prepare an Agriculture and Rural Development Strategy for 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.

The Vanuatu Government is currently developing a holistic agricultural plan for the country which will give direction to future ACIAR cooperation in agriculture and fisheries. For the current planning period, the focus of ACIAR activities in Vanuatu will be in forestry. Forest covers almost 40% of the total land area of the country, 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 whitewood.

Samoa

Samoa has recently had comparatively strong economic growth across a range of sectors, including agriculture. 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, and 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; better use of timbers. 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, which limits income-generating opportunities, and relatively high youth unemployment. Opportunities exist for increased income generation through the development of products for the local market and the exploitation of market niches.

For crop-related research, future support is likely to be in the areas of diversification, improved productivity, reduction in input costs and postharvest quality improvement. There is a current emphasis on farming systems, and development of markets (local and inter-island) 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. Development of agroforestry-based farming systems (including tree legumes and fruit trees) is a priority 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).



A Whitewood plantation in Vanuatu

Active projects in the Pacific

