

# Appendixes

## Appendix 2: Balancing ACIAR's project portfolio: project design and delivery

ACIAR projects aim to deliver technical interventions and solutions to the problems that constrain more-productive and sustainable agricultural systems. In the recent past ACIAR has introduced changes to project design, development and evaluation to give more emphasis to adoption pathways and the expected impact of proposed research, development and extension studies. The goal is to enhance adoption of project results by the targeted beneficiaries or end users (smallholder farmers, fishers, industry, natural resources managers and policymakers).

### Increased emphasis on delivering benefits through projects that directly target end users

ACIAR's Annual Operational Plan outlines indicative priorities by program and country. These priorities have been drawn up to focus projects on specific topic areas. ACIAR expects this focus to result in more projects that take research outputs through to a pilot extension phase in which end users are directly involved. To support this change, ACIAR is developing more partnerships that involve private-sector extension agencies, the commercial sector, NGOs, government extension agencies and public-sector researchers.

In assessing new proposals, ACIAR will consider whether the proposed research is an appropriate intervention to improve livelihoods and stimulate economic growth. More biophysical and socioeconomic benchmarking will be conducted, often involving a suite of scoping studies commissioned by ACIAR as 'small research activities'.

### Consideration of the expected time to impact for new project proposals

ACIAR has defined the following categories of 'expected time for the project results to impact on groups outside those directly involved in the research':

***Category 1 (near-term impact): significant community-level impacts are likely within 5 years of project completion***

ACIAR aims to invest 40% of new project expenditure in projects that should, in the near term, achieve significant

impacts for communities outside those directly involved in the project R&D activities. This category may include projects where: the technical concepts are already well proven in the particular context and the focus is on facilitation of adoption; there is good local capacity and strong demand-pull for the project outputs from local end-user groups; and markets are well defined and accessible. It may also focus on areas where strong linkages with private enterprises, farmer groups and senior policymakers, or with other large-scale development activities, will assist adoption and sustainability beyond project life.

***Category 2 (medium-term impact): significant community-level impacts are likely within 5–10 years of project completion***

A further 40% of ACIAR's new project expenditure is aimed at projects designed to have impacts in the medium term. This category may include projects that involve adaptation of proven technical concepts to a local situation, or enhancement of local capacity to deal with the issue under study. It may involve the next users of the project outputs, intermediaries such as extension workers, or local/regional policymakers rather than the ultimate end users. This category may be appropriate where further investment is likely to be required to facilitate large-scale adoption of outputs.

***Category 3 (long-term impact): achievement of significant community-level impacts is likely to take more than 10 years from project completion***

The remaining 20% of ACIAR's new project expenditure is aimed at projects of a more-strategic nature where extensive research is required to develop or prove a model or concept. Other scientists are the main user group, local research capacity building is a major aspect of the project, and project outputs are likely to require further refinement and adaptation through several more research cycles before a product is available for testing in the field.

Full details are included in Appendix 1 of ACIAR's Project Development Guidelines, located at <[http://www.aciar.gov.au/project\\_dev](http://www.aciar.gov.au/project_dev)>.

## Scoping of relevant R&D activities

In addition to its investments in collaborative R&D projects, ACIAR may commission scoping studies to gain a better understanding of the nature of a research problem and the issues involved in delivering solutions to end users. Scoping studies will aim to identify appropriate R&D interventions and approaches that will set the scene for larger, longer term and sectorally focused investments on a country-by-country basis.

## Capturing data on project impacts more broadly and more regularly

An impact assessment framework (*Measuring the poverty impact of ACIAR projects: a broad framework*, ACIAR Impact Assessment Series Report 19) was developed in 2002. ACIAR promotes this framework for identifying and measuring issues such as attitudinal change and non-market benefits (e.g. better water quality, ecosystem integrity, healthier people, greater sense of empowerment, increased institutional efficiency). In addition, ACIAR will continue to commission studies of adoption of outputs from large projects completed 3–4 years ago, as well as formal economic impact assessments of selected projects.

## Appendix 3: Benefits to Australia

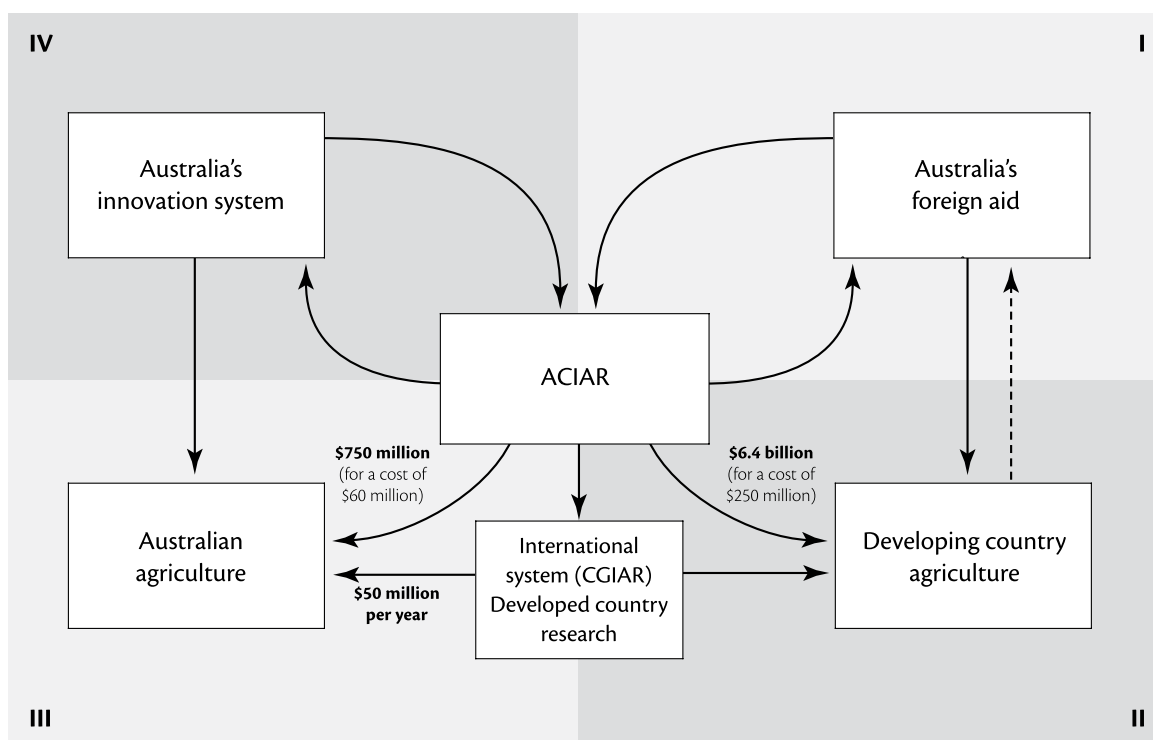
### ACIAR in the context of Australia's development assistance program

ACIAR was established in 1982 and holds a unique position as the interface between Australia's agricultural innovation system and development assistance program. Given that Australia's range of climates (temperate, tropical and subtropical) match those found in developing countries, ACIAR's research focus is well suited to improving sustainable agricultural production in developing countries through a collaborative research approach that tackles problems of mutual interest and benefit to developing countries and Australia. Research is funded both directly by ACIAR and through the IARCs, primarily members of the CGIAR.

The Australian benefits study published in ACIAR's Impact Assessment Series (IAS) No. 39 (*Benefits to Australia from ACIAR-funded research*) highlights schematically (Figure 1) where ACIAR sits in the aid and innovation system.

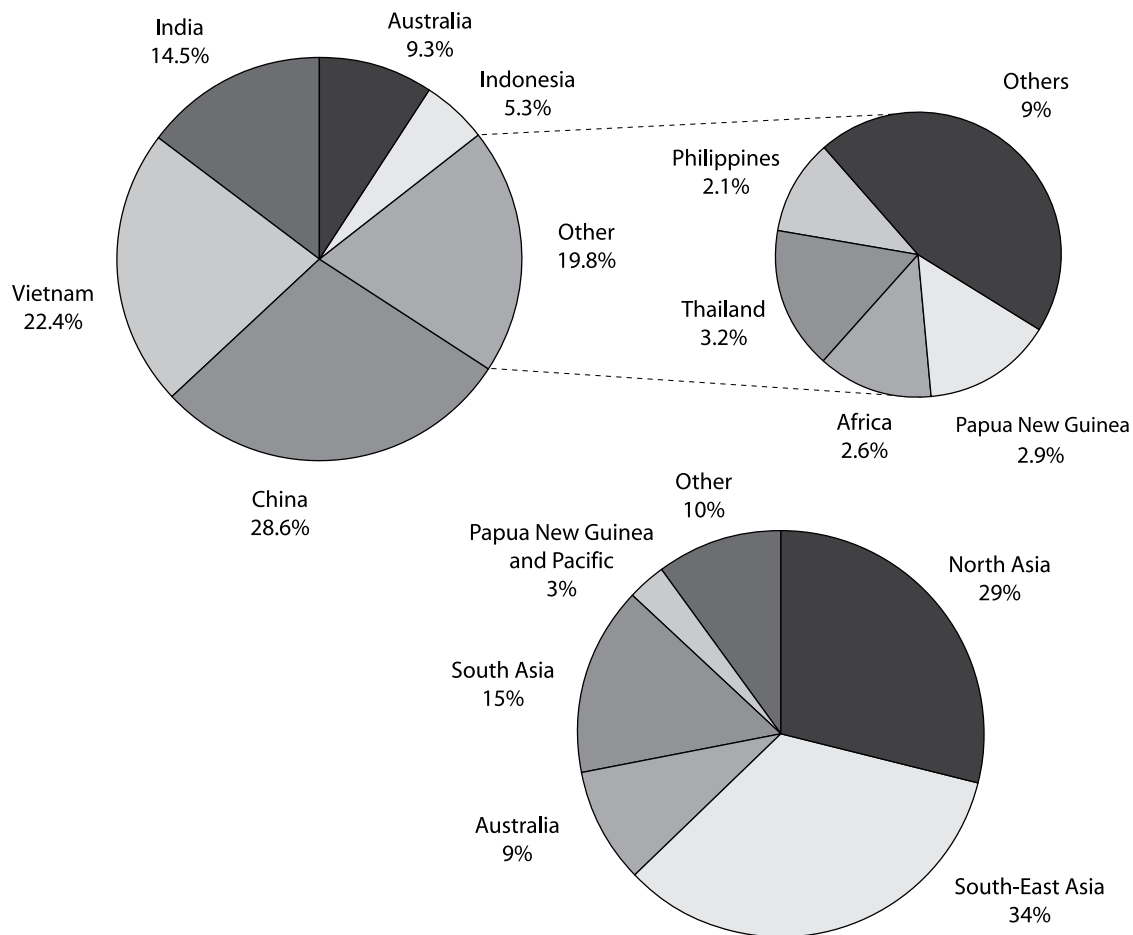
The area of most relevance in Figure 1 is quadrant II. Through its research, ACIAR aims to deliver measurable benefits to developing-country agriculture. The analysis presented in IAS 63 (*Analysis of ACIAR's returns on investment: appropriateness, efficiency and effectiveness*) indicates that the total benefits to ACIAR research estimated from 37 detailed quantitative economic impact assessments (covering 90 projects) amounts to A\$12.6 billion, for a total investment of around A\$234 million (present value terms in 2008 dollars). Of these benefits, around A\$6.8 billion are directly attributable to ACIAR funding.

Benefits arising from ACIAR research also accrue to Australian agriculture (quadrant III of Figure 1). In IAS 63 these benefits were examined in detail. Total benefits to Australia resulting from ACIAR research were around A\$1.2 billion in 2008 dollar present-value terms. Figure 2 shows the distribution of benefits across countries.



Source: ACIAR Impact Assessment Series No. 39, p. 9

Figure 1. ACIAR's position in the international agricultural assistance and innovation system



Data source: ACIAR Impact Assessment Series No. 63, p.13

Figure 2. Distribution of total benefits from ACIAR research projects, by country and region

ACIAR research delivers benefits to Australian agriculture from:

- » new production technology
- » protection from pests and diseases
- » increased trade
- » increases in the stock of knowledge of Australian researchers.

The benefits to Australia calculated to date are mostly of the first three types. While widely recognised as being extremely important, it is difficult to estimate the value of the increase in stock of knowledge and research capacity. ACIAR continues to fund research in areas where further benefits to Australia are likely to be realised.

## Examples of current projects expected to deliver benefits to Australia

### Strengthening biosecurity and surveillance of exotic animal diseases

The experience gained by Australian professionals working with exotic diseases, including FMD in Laos and Cambodia (AH/2006/025), strengthens Australian capacity to detect exotic disease incursions and respond to them. One current project on avian influenza aims to better understand the role of ducks in the spread of the disease (AH/2004/040). Other projects are building a multi-stakeholder forum to develop new biosecurity policies for commercial and smallholder poultry enterprises (AH/2006/169), and assessing the risks associated with livestock movement in eastern Indonesia (AH/2006/156). The emerging methodologies have equal value for Australian livestock industries.

In PNG and northern Australia (Cape York) local communities have become involved in using new surveillance systems to detect and report sick animals (AH/2006/157). This is a valuable skill to help detect

rabies incursions, of particular interest since the rabies epidemic in Bali in 2009. Project AH/2006/166 is helping Indonesia to develop Indovetplan as a counterpart strategy to Ausvetplan for exotic disease emergencies.

### Improving yields through water and nitrogen management

Growing pulses such as soybean or mung bean in rotation with sugarcane and cereal crops helps to boost yield and quality. Yields can be up to 30% higher and protein content in cereals can lift by 0.5–1.8%. Despite these benefits, poor soybean establishment brought on by poor nodulation is estimated to cause annual losses close to \$1.63 million for growers. Mung bean, which is typically grown as a rotation crop in cereal-based cropping systems, also lags due to insufficient information on appropriate agronomic practices. A project on productivity and profitability enhancement of tropical pulses in Indonesia and Australia (SMAR/2007/068) is seeking to overcome these problems.

ACIAR is augmenting work undertaken by the Grains Research and Development Corporation (GRDC) in Republic of South Africa. Project LPS/2004/022 has selected African legume species that have potential to grow well in large areas of southern Western Australia—a region where the legumes presently available grow poorly. In particular, two species of the genus *Lotononis* have been successful in trials. The new forage species show promise for communal grazing and salinity management.

A project (LWR/2003/039) seeks to improve the management of water and nitrogen fertiliser for agricultural profitability, water quality and reduced nitrous oxide (N<sub>2</sub>O) emissions in China and Australia. It focuses on systems of irrigated maize and wheat farms in the western Yellow River basin of northern China; in Australia the focus is on irrigated crops and pastures in northern Victoria and the Riverina of New South Wales, and on rainfed wheat in Western Australia. The project has significant components on quantifying N<sub>2</sub>O emissions, and developing and implementing mitigation strategies, supported by the Australian Greenhouse Office.

### Lifting livestock productivity

A project to improve smallholder cattle fattening systems in eastern Indonesia (LPS/2008/054) encourages the addition of forage tree legumes to the diet. Cattle in northern Australia also graze on the tree legume leucaena. But toxic compounds in leucaena can affect animals in both countries. Project scientists are having success in counteracting this toxicity by introducing

micro-organisms that can degrade the compounds in the animal's digestive tract. Effective treatment will make the leucaena more digestible and lead to significant gains in the live weight of animals.

Across northern Australia, cattle herds face suboptimal reproductive performance due to multiple factors including nutritional and climatic stress. A lack of understanding about the contribution of these factors to reproductive performance is limiting the ability of researchers to target technology and guide decision-making. The 'cash cow' project co-funded by Meat and Livestock Australia assesses the reproductive performance of selected commercial beef breeding herds. This ACIAR project (LPS/2008/038) is helping the cash cow initiative by identifying the nutritional factors that impact on reproduction.

Major initiatives such as the expansion of sorghum for ethanol production provide a large volume of by-product and a potential locally available feed source for pigs. A project (LPS/2002/079) is determining the extent to which such by-products can substitute as high-protein feeds. Comparison of the nutritive-value digestibility of these and other feeds (including pearl millet, cottonseed meal, distiller grains and sunflower meal) as well as growth performance trials are providing producers with data on which to base guidelines for pig feeding. Improved allocation of feed resources and reduced costs of transporting feed could save the Queensland pig industry \$5.3 million per year.

### Commercial-scale lobster aquaculture

Development of spiny lobster aquaculture in Indonesia, Vietnam and Australia (SMAR/2008/021) is a prelude to initiating lobster grow-out on a commercial scale in Australia. A segment of the project is assessing commercial-scale, land-based grow-out systems to prepare the Australian aquaculture sector for the likely availability of hatchery-reared lobster seed. Hatchery technology is currently being commercialised in Queensland through a partnership between the Queensland Department of Employment, Economic Development and Innovation and Lobster Harvest Pty Ltd. Development will also be pursued by establishing a pilot grow-out system in an Indigenous community (possibly Torres Strait, Lockhart River or Yarrabah), initially to simply fatten small, legal-size lobsters from the local fishery.

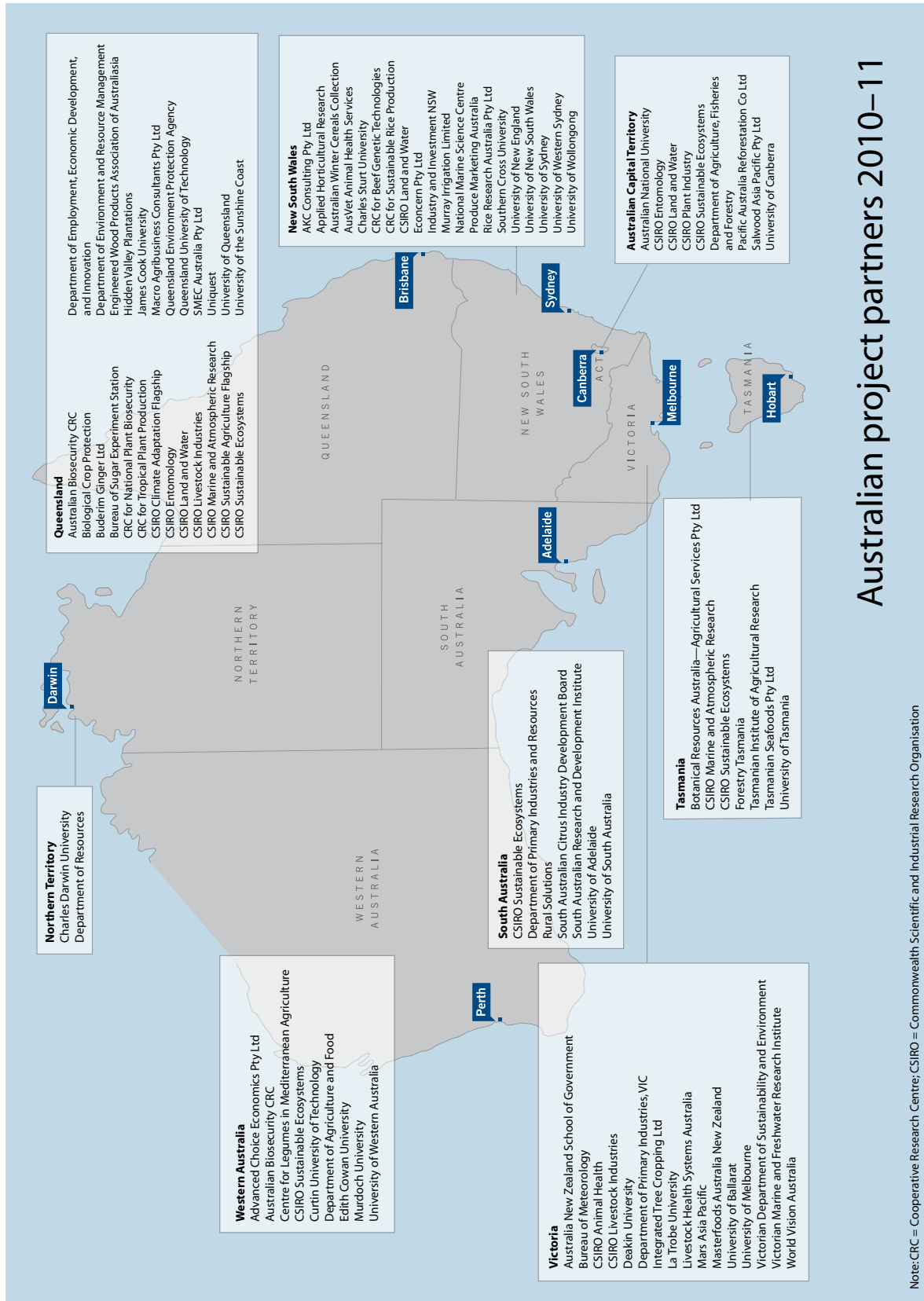
## Solving productivity and disease problems in fruits and vegetables

A current project (SMCN/2008/032) to increase vegetable production in Central province, PNG, has findings that apply to Australia. Temperatures in highland areas of PNG are similar to those in temperate areas of Australia, including Tasmania. Of special interest are brassica crops and onions. The project is undertaking studies such as crop simulation modelling, development of decision support systems, and land suitability assessment using remote sensing and carbon footprinting, all of which will benefit both Australia and PNG.

A current project (AGB/2005/167) seeks to optimise the productivity of the potato cropping system in parts of Indonesia. The development of highly productive potato systems in Central and West Java, South Sulawesi and West Nusa Tenggara relies upon clean and viable planting material (seed potatoes). Western Australia exports about 10,000 t of world-class seed potatoes annually, and is one of only three locations from which Indonesia allows imports to support their industry's growth. Principal attributes of the potatoes are their high quality and freedom from pests and disease. The ongoing growth of the Indonesian potato sector will continue to benefit the Western Australian seed potato export industry.

A project in Vietnam (AGB/2006/112) includes in its objectives an assessment of the potential of new Asian vegetables for the wider Australian market, in association with the development of sustainable production systems. Importantly for the cropping industries in Australia, the project is also addressing the potential food safety issue of nitrate accumulation in leafy Asian vegetables produced in hydroponic systems.

Huanglongbing (citrus greening) is a citrus disease caused by a proteobacterium and spread by an insect, the Asiatic citrus psyllid. The disease is a serious impediment to citriculture in Asia because it can destroy orchards within 5 years of planting. Vietnam and Indonesia are particularly affected. Neither the disease nor its vector occurs in Australia, but there is a high risk that they could be introduced by natural and unintentional human-assisted spread through Indonesia and PNG. A project (HORT/2000/043) is helping these countries to control the spread of the disease more effectively and to prevent loss of biodiversity of citrus species. The project outputs will reduce the risk to Australia, and also provide citrus growers in Australia with a plan to follow should the disease enter the country.



# Australian project partners 2010–11

Note: CRC = Cooperative Research Centre; CSIRO = Commonwealth Scientific and Industrial Research Organisation



## Appendix 5: Selected world development indicators

	Adult illiteracy (% of those aged 15 years and older) <sup>a</sup>	Economic activity rate (% of those aged 15 years and older) <sup>b</sup>	GDP (US\$ billion) <sup>a</sup>	GDP growth annual (%) <sup>c</sup>	GDP per capita (US\$) <sup>b</sup>	Human development index (ranking out of 182 countries) <sup>a</sup>	Human poverty index <sup>a</sup>	Population below the income poverty line (\$2/day)(%) <sup>a</sup>	Agricultural land as % of land area <sup>c</sup>	Life expectancy at birth (years) <sup>a</sup>	Official development assistance— per capita (US\$) <sup>a</sup>	Population (millions) <sup>b</sup>	Rural population as % of total <sup>b</sup>	Rate of natural population increase (%) <sup>a</sup>	Population not using an improved water source (%) <sup>a</sup>
<b>Papua New Guinea and Pacific island countries</b>															
PNG	42.2	72	6.3	5.8	1,218	148	121	57.4	2.4	60.7	50	6.7	88	2.4	60
Fiji	..	59	3.4	0.2	4,264	108	79	..	25.2	68.7	69	0.8	47	1.5	53
Solomon Islands	23.4	36	0.4	7.4	1,284	135	80	..	3.0	65.8	500	0.5	82	2.5	30
Vanuatu	21.9	84	0.5	6.6	2,388	126	83	..	12.1	69.9	251	0.2	75	2.5	41
Samoa	1.3	58	0.5	-3.4	2,988	94	..	..	32.9	71.4	197	0.2	77	1.8	12
Tonga	0.8	64	0.3	1.2	2,891	99	..	..	41.7	71.7	304	0.1	75	2.2	0
Kiribati	..	..	0.1	3.4	804	..	..	..	45.7	..	..	0.1	56	..	..
<b>Indonesia, East Timor, Philippines</b>															
Indonesia	8.0	68	432.8	6.1	2,247	111	69	..	26.4	70.5	3	230.0	47	1.2	20
East Timor	49.9	71	0.4	13.2	518	162	122	77.5	22.9	60.7	241	1.1	72	3.1	38
Philippines	6.6	64	144.1	3.8	1,866	105	54	45.0	40.9	71.6	7	92.0	34	2.0	7
<b>Mekong countries and China</b>															
Vietnam	9.7	72	68.6	6.1	1,041	116	55	48.4	30.9	74.3	29	88.1	72	1.2	8
Cambodia	23.7	79	8.3	5.2	769	137	87	68.2	30.3	60.6	46	14.8	78	1.6	35
Lao PDR	27.3	78	4.1	7.5	858	133	94	76.8	8.5	64.6	68	6.3	68	2.1	40
Burma	10.1	74	..	..	578	138	77	..	17.1	61.2	4	50.0	67	1.1	20
China	6.7	74	3,205.5	9.0	3,292	92	36	36.3	59.6	72.9	1	1,345.8	56	0.7	12
<b>South and West Asia</b>															
India	34.0	58	1,176.9	7.1	1,061	134	88	75.6	60.6	63.4	1	1,198.0	70	1.4	11
Pakistan	45.8	54	142.9	6.0	1,010	141	101	60.3	35.1	66.2	13	180.8	63	2.3	10
Bangladesh	46.5	71	68.4	6.2	494	146	112	81.3	69.2	65.7	9	162.2	72	1.5	20
Iraq	25.9	41	..	..	788	..	75	..	22.9	67.8	314	30.7	34	2.6	23
Afghanistan	72.0	60	8.4	..	466	181	135	..	58.3	43.6	146	28.1	76	2.7	78
Bhutan	47.2	61	1.1	13.8	1,933	132	102	49.5	12.6	65.7	135	0.7	64	1.4	19
<b>Sub-Saharan Africa</b>															
South Africa	12.0	55	283.0	3.1	5,566	129	85	42.9	82.0	51.5	16	82.0	39	0.7	7
Botswana	17.1	76	12.3	-1.0	6,108	125	81	49.4	45.8	53.4	56	45.8	40	1.3	4
Ethiopia	64.1	84	19.4	11.3	319	171	130	77.5	33.9	54.7	29	82.8	83	2.7	58
Kenya	26.4	82	24.2	3.6	788	147	92	39.9	47.5	53.6	34	39.8	78	2.7	43
Tanzania	27.7	..	16.2	7.5	..	151	93	96.6	..	55.0	69	..	..	3.0	45
Mozambique	55.6	86	7.8	6.5	440	172	127	90.0	61.8	47.8	83	22.9	62	2.3	58
Zimbabwe	8.8	66	3.4	..	314	..	105	..	40.4	43.4	35	12.5	62	1.4	19

<sup>a</sup> United Nations Development Programme, Human Development Report 2009 Online <[http://hdr.undp.org/en/media/HDR\\_2009\\_EN\\_Complete.pdf](http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf)>

<sup>b</sup> United Nations Statistics Division Online 2009, selected data from 2008 and 2009, <<http://unstats.un.org/unsd/demographic/products/socind/>>, updated December 2009

<sup>c</sup> The World Bank, World Development Indicators 2009, United Nations Common Database, <[http://unstats.un.org/unsd/cdb\\_discontinued/cdb\\_discontinued.asp](http://unstats.un.org/unsd/cdb_discontinued/cdb_discontinued.asp)>

## Selected world development indicators: definitions

**Adult illiteracy:** calculated as 100 minus the adult literacy rate

**Economic activity rate:** adult economic activity rate refers to the percentage of the population aged 15 years and over, unless otherwise specified, that is economically active. Economically active is defined as all employed and unemployed persons, including those seeking work for the first time; it covers employers operating unincorporated enterprises, persons working on their own account, employees, unpaid contributing family workers, members of producers' cooperatives and members of the armed forces. In the internationally recommended definition, production of primary products such as foodstuffs for own consumption and certain other non-monetary activities are considered economic activity, and persons engaged in such production are considered to be economically active. In principle, any such work for as little as 1 hour per week is taken to define a person as economically active

**GDP (US\$):** gross domestic product (GDP) converted to US dollars using the average official exchange rate reported by the International Monetary Fund. An alternative conversion factor is applied if the official exchange rate is judged to diverge by an exceptionally large margin from the rate effectively applied to transactions in foreign currencies and traded products

**GDP annual growth rate:** least squares annual growth rate, calculated from constant price GDP in local currency units

**GDP per capita (US\$):** GDP in US dollar terms divided by mid-year population

**Human development index (HDI):** a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living

**Human poverty index (HPI):** a composite index measuring deprivations in the three basic dimensions captured in the human development index—a long and healthy life, knowledge and a decent standard of living

**Population below the income poverty line (\$2/day (%)):** the percentage of the population living below the specified poverty line: US\$2 a day—at 2005 international prices adjusted for purchasing power parity

**Agricultural land as a percentage of of land area:** refers to the share of land area that is arable, under permanent crops or under permanent pastures. Arable land includes land defined by the FAO as land under temporary crops (double-cropped areas are counted

once), temporary meadows for mowing or pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded. Land under permanent crops is land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest, such as cocoa, coffee and rubber. This category includes land under flowering shrubs, fruit trees, nut trees and vines, but excludes land under trees grown for wood or timber. Permanent pasture is land used for 5 or more years for forage, including natural and cultivated crops

**Life expectancy at birth:** the number of years a newborn infant would live if prevailing patterns of age-specific mortality rates at the time of birth were to stay the same throughout the child's life

**Official development assistance (ODA) per capita (US\$):** disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions and by non-DAC countries to promote economic development and welfare in countries and territories in part I of the DAC list of aid recipients. It includes loans with a grant element of at least 25% (calculated at a discount rate of 10%)

**Population:** refers to the de facto population in a country, area or region as of 1 July of the year indicated

**Rural population as a percentage of the total:** the urban–rural classification of population in internationally published statistics follows the national census definition, which differs from one country or area to another. National definitions are usually based on criteria that may include any of the following: size of population in a locality, population density, distance between built-up areas, predominant type of economic activity, legal or administrative boundaries, and urban characteristics such as specific services and facilities

**Rate of natural population increase (%):** the portion of population growth (or decline) determined exclusively by births and deaths

**Population not using an improved water source (%):** calculated as 100 minus the percentage of the population using an improved water source. Improved sources include household connections, public standpipes, boreholes, protected dug wells, protected springs and rainwater collection

## Appendix 6: Major crop, livestock and fisheries production indicators by partner country

### Papua New Guinea and Pacific island countries

#### Papua New Guinea

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Fresh fruit	920,000	Game meat	365,000	Marine fish	251,327
Bananas	870,000	Pig meat	68,000	Misc. aquatic animals	28,967
Coconuts	677,000	Chicken meat	5,850	Freshwater fish	10,814
Sweetpotatoes	580,000	Hen eggs	4,950	Diadromous fish	853
Sugarcane	450,000	Cattle meat	3,210	Crustaceans	578

#### Fiji

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Sugarcane	2,513,000	Cow milk, whole, fresh	58,000	Marine fish	44,695
Coconuts	140,000	Chicken meat	14,429	Molluscs	1,726
Taro (cocoyam)	61,662	Cattle meat	8,360	Crustaceans	1,312
Cassava	61,379	Pig meat	3,982	Misc. aquatic animals	729
Rice, paddy	14,849	Hen eggs	3,401	Freshwater fish	373

#### Solomon Islands

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Coconuts	276,000	Pig meat	2,320	Marine fish	31,232
Sweetpotatoes	86,000	Cow milk, whole, fresh	1,430	Misc. aquatic animals	20
Taro (cocoyam)	40,000	Cattle meat	740	Crustaceans	15
Palm oil	35,800	Hen eggs	488	Molluscs	5
Yams	30,000	Chicken meat	280		

## Vanuatu

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Coconuts	307,700	Cow milk, whole, fresh	3,200	Marine fish	85,036
Roots and tubers	43,000	Pig meat	2,850	Crustaceans	268
Bananas	14,500	Cattle meat	2,750	Molluscs	55
Vegetables, fresh	11,500	Chicken meat	550	Misc. aquatic animals	15
Fresh fruits	4,900	Hen eggs	400	Freshwater fish	13

## Samoa

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Coconuts	146,000	Pig meat	4,000	Marine fish	3,980
Bananas	23,000	Cow milk, whole, fresh	1,500	Misc. aquatic animals	222
Taro (cocoyam)	17,600	Cattle meat	1,000	Crustaceans	203
Pineapples	4,600	Natural honey	400	Molluscs	200
Mangoes, mangosteen and guava	4,000	Chicken meat	340	Freshwater fish	4

## Tonga

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Coconuts	58,500	Pig meat	1,550	Marine fish	2,145
Pumpkins, squash and gourds	21,000	Cow milk, whole, fresh	370	Crustaceans	350
Cassava	9,700	Cattle meat	360	Molluscs	54
Sweetpotatoes	6,800	Chicken meat	304		
Vegetables, fresh	5,700	Hen eggs	300		

## Indonesia, East Timor and Philippines

### Indonesia

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Rice, paddy	57,157,436	Chicken meat	1,358,390	Marine fish	4,120,171
Sugarcane	25,300,000	Hen eggs	1,266,900	Freshwater fish	1,030,597
Cassava	19,988,058	Pig meat	636,790	Crustaceans	637,895
Coconuts	17,000,000	Cow milk, whole fresh	574,406	Diadromous fish	360,926
Palm oil	16,900,000	Cattle meat	352,413	Molluscs	166,890

### East Timor

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Maize	63,430	Pig meat	11,000	Marine fish	344
Cassava	49,720	Chicken meat	1,840	Crustaceans	4
Roots and tubers	45,000	Hen eggs	1,600	Misc. aquatic animals	1
Rice, paddy	41,386	Cattle meat	1,100	Molluscs	1
Sweetpotatoes	26,000	Buffalo meat	570		

### Philippines

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Sugarcane	32,500,000	Pig meat	1,605,984	Marine fish	2,187,619
Rice, paddy	16,240,194	Chicken meat	740,660	Diadromous fish	355,836
Coconuts	14,852,900	Hen eggs	550,000	Freshwater fish	355,279
Bananas	7,484,073	Cattle meat	180,035	Molluscs	172,063
Maize	6,736,940	Buffalo meat	75,500	Crustaceans	137,567

## Mekong countries and China

### Vietnam

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Rice, paddy	35,942,700	Pig meat	2,553,000	Freshwater fish	1,663,900
Sugarcane	17,396,700	Chicken meat	358,800	Marine fish	1,433,000
Cassava	8,192,800	Cow milk, whole, fresh	240,000	Crustaceans	668,100
Vegetables, fresh	6,600,000	Hen eggs	225,000	Molluscs	512,900
Maize	4,303,200	Cattle meat	206,145	Misc. aquatic animals	17,190

### Cambodia

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Rice, paddy	6,727,000	Pig meat	110,000	Freshwater fish	452,970
Cassava	2,215,000	Cattle meat	62,400	Marine fish	37,000
Maize	523,000	Cow milk, whole, fresh	23,800	Crustaceans	19,330
Vegetables, fresh	487,000	Chicken meat	19,000	Molluscs	4,900
Sugarcane	170,000	Hen eggs	13,300		

### Lao PDR

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Rice, paddy	2,710,050	Pig meat	54,000	Freshwater fish	104,925
Maize	690,795	Cattle meat	26,000		
Vegetable, fresh	660,000	Buffalo meat	18,600		
Sugarcane	323,875	Chicken meat	17,200		
Cassava	233,420	Hen eggs	14,500		

### China

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Rice, paddy	187,397,460	Pig meat	61,150,000	Freshwater fish	18,678,462
Maize	152,418,870	Cow milk, whole, fresh	35,853,665	Molluscs	12,234,680
Vegetables, fresh	146,902,838	Hen eggs	22,749,200	Marine fish	9,075,497
Sugarcane	113,731,917	Chicken meat	11,054,320	Crustaceans	5,054,959
Wheat	102,298,296	Cattle meat	5,845,149	Misc. aquatic animals	672,955

## Thailand

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Sugarcane	64,365,482	Chicken meat	1,018,844	Marine fish	1,943,105
Rice, paddy	32,099,401	Pig meat	864,000	Freshwater fish	693,761
Cassava	26,915,541	Cow milk, whole, fresh	827,252	Crustaceans	645,394
Maize	3,661,323	Hen eggs	562,000	Molluscs	538,909
Rubber	3,024,207	Cattle meat	241,995	Misc. aquatic animals	21,642

## Burma

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Rice, paddy	31,450,000	Cow milk, whole, fresh	980,314	Marine fish	1,485,740
Sugarcane	7,000,000	Chicken meat	726,497	Freshwater fish	1,273,937
Vegetables, fresh	3,200,000	Pig meat	463,070	Crustaceans	78,363
Beans, dry	2,500,000	Hen eggs	231,462	Misc. aquatic animals	2,200
Fresh fruit	1,250,000	Buffalo milk, whole, fresh	220,462		

## South and West Asia

### India

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Sugarcane	355,197,000	Buffalo milk, whole, fresh	60,900,000	Freshwater fish	3,948,901
Rice, paddy	144,570,000	Cow milk, whole, fresh	44,100,000	Marine fish	2,613,709
Wheat	75,806,700	Goat milk, whole, fresh	4,000,000	Crustaceans	596,934
Vegetable, fresh	29,117,400	Hen eggs	2,740,000	Molluscs	86,600
Potatoes	28,599,600	Chicken meat	2,490,000	Diadromous fish	43,139

### Pakistan

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Sugarcane	54,741,600	Buffalo milk, whole, fresh	20,985,000	Marine fish	311,557
Wheat	23,294,700	Cow milk, whole, fresh	11,550,000	Freshwater fish	230,000
Rice, paddy	8,345,100	Buffalo meat	708,000	Crustaceans	22,439
Seed cotton	3,694,900	Goat milk, whole, fresh	700,000	Molluscs	6,071
Maize	3,605,000	Cattle meat	680,000	Diadromous fish	215

### Bangladesh

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Rice, paddy	43,570,000	Goat milk, whole, fresh	2,168,000	Freshwater fish	1,783,288
Sugarcane	5,769,945	Cow milk, whole, fresh	825,000	Diadromous fish	279,189
Potatoes	5,167,000	Goat meat	210,000	Marine fish	238,825
Vegetables, fresh	1,096,000	Hen eggs	197,500	Crustaceans	138,709
Bananas	1,004,520	Cattle meat	187,000		

## Iraq

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Wheat	2,228,000	Cow milk, whole, fresh	400,000	Freshwater fish	59,570
Tomatoes	830,000	Chicken meat	97,000	Marine fish	12,020
Barley	748,000	Hen eggs	50,000	Diadromous fish	1,611
Potatoes	598,000	Cattle meat	50,000	Crustaceans	388
Watermelon	578,000	Goat milk, whole fresh	16,940		

## Bhutan

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Maize	61,789	Cow milk, whole, fresh	42,405	Marine fish	1,485,740
Rice, paddy	74,438	Cattle meat	5,100	Freshwater fish	1,273 937
Potatoes	61,133	Pig meat	935	Crustaceans	7,863
Oranges	36,500	Buffalo milk, whole, fresh	320	Misc. aquatic animals	2,200
Citrus fruit	32,000	Chicken meat	259		

## Afghanistan

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Wheat	4,484,000	Cow milk, whole, fresh	1,309,800	Freshwater fish	1,000
Vegetables, fresh	600,000	Cattle meat	133,000		
Rice, paddy	552 000	Goat milk, whole, fresh	112,800		
Barley	370,000	Goat meat	41,600		
Maize	360,000	Hen eggs	16,800		

## Sub-Saharan Africa

### Republic of South Africa

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Sugarcane	20,300,000	Cow milk, whole, fresh	3,060,000	Marine fish	655,540
Maize	7,125,000	Chicken meat	975,000	Molluscs	11,856
Potatoes	1,972,391	Cattle meat	805,000	Crustaceans	3,684
Wheat	1,905,000	Hen eggs	485,250	Freshwater fish	1,280
Grapes	1,813,003	Pig meat	150,000	Diadromous fish	1,000

### Ethiopia

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Roots and tubers	4,950,000	Cow milk, whole fresh	1,350,000	Freshwater fish	13,253
Maize	3,336,795	Cattle meat	380,000		
Wheat	2,219,095	Camel milk, whole, fresh	194,000		
Sugarcane	2,270,000	Game meat	83,000		
Sorghum	2,173,599	Sheep meat	81,500		

### Kenya

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Sugarcane	5,204,214	Cow milk, fresh, whole	3,990,000	Freshwater fish	128,457
Maize	2,928,793	Cattle meat	365,000	Marine fish	6,399
Potatoes	850,000	Goat milk, fresh, whole	110,000	Crustaceans	638
Sweetpotatoes	811,531	Hen eggs	69,000	Molluscs	413
Brassicas	609,292	Goat meat	45,100	Diadromous fish	81

### Tanzania

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Cassava	6,600,000	Cow milk, whole, fresh	850,000	Freshwater fish	284,350
Maize	3,659,000	Cattle meat	247,000	Marine fish	41,933
Bananas	3,500,000	Goat milk, whole, fresh	105,000	Crustaceans	1,656
Sugarcane	2,370,000	Chicken meat	45,700	Molluscs	882
Rice, paddy	1,341,846	Hen eggs	35,100	Diadromous fish	6

## Malawi

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Cassava	3,238,943	Cow milk, whole, fresh	35,484	Freshwater fish	57,000
Maize	3,226,418	Pig meat	33,962		
Potatoes	2,858,811	Cattle meat	28,815		
Sugarcane	2,500,000	Hen eggs	19,780		
Bananas	390,000	Chicken meat	15,280		

## Mozambique

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Cassava	5,038,623	Cow milk, whole, fresh	66,300	Marine fish	55,788
Sugarcane	2,060,677	Chicken meat	35,550	Freshwater fish	24,226
Maize	1,152,050	Cattle meat	20,250	Crustaceans	12,405
Coconuts	239,660	Hen eggs	14,000	Molluscs	689
Pulses	205,000	Pig meat	12,840		

## Zimbabwe

Crops	Production (tonnes)	Livestock / livestock products	Production (tonnes)	Fisheries	Production (tonnes)
Sugarcane	3,000,000	Cow milk, whole, fresh	250,000	Freshwater fish	12,950
Maize	952,600	Cattle meat	97,000		
Vegetables, fresh	253,320	Chicken meat	36,455		
Seed cotton	209,730	Game meat	32,000		
Cassava	138,350	Pig meat	27,775		

Sources: crop and livestock production data, <<http://faostat.fao.org>>; fisheries data, <<http://www.fao.org/fishery/statistics/global-production/query/en>>

## Appendix 7: Major forestry indicators for partner countries

Region/country	Total forest area in 2005 ('000 ha)	Percentage of land area in 2005	Forest plantations in 2005 ('000 ha)	Annual rate of change 2000–05 (%)
<b>Papua New Guinea and Pacific island countries</b>				
Papua New Guinea	29,437	65.0	92	-0.5
Fiji	1,000	54.7	101	0
Solomon Islands	2,172	77.6	–	-1.7
Vanuatu	440	36.1	–	0
Samoa	171	60.4	32	0
Tonga	4	5.0	–	0
Kiribati	2	30.0	–	0
<b>Indonesia, East Timor and Philippines</b>				
Indonesia	104,986	58.0	3,399	-2.0
East Timor	798	53.7	43	-1.3
Philippines	7,162	24.0	620	-2.1
<b>Mekong countries and China</b>				
Vietnam	10,447	59.2	2,695	-2.0
Lao PDR	16,142	69.9	224	-0.5
China	197,290	21.2	31,369	2.2
Thailand	14,520	28.4	3,099	-0.4
Burma	32,222	49.0	849	-1.4
<b>South and West Asia</b>				
India	67,701	22.8	3,226	–
Pakistan	2,361	3.0	318	-2.1
Bangladesh	871	6.7	279	-0.3
Iraq				
Bhutan	3,195	68.0	2	0.3
Afghanistan	867	1.3	–	-3.1
<b>Sub-Saharan Africa</b>				
South Africa	9,203	7.6	1,426	0

Source: Food and Agriculture Organization (FAO) of the United Nations 2005. *Global Forest Resources Assessment 2005: progress towards sustainable forest management. Forestry Paper 147*. FAO: Rome.

## Appendix 8: ACIAR management structure

**In December 2009 ACIAR adopted a revised management and operational structure. These changes build onto the pre-existing combined regional and discipline-based systems, with a focus on both regional and country-level research applications and the multidisciplinary roles of Research Program Managers (RPMs).**

The organisational changes will involve a flatter management structure that reflects ACIAR's regional and country emphases. ACIAR has appointed four Principal Regional Coordinators (PRCs) responsible for overseeing ACIAR research activities across four regions: PNG and Pacific island countries; Mekong countries and China; Indonesia, East Timor and the Philippines; and South Asia and Africa, respectively (see Figure 3). The PRCs will lead the development of country strategies and prepare country/regional budget proposals for approval by the Chief Executive Officer (CEO). The PRCs will work with the RPMs to:

- » manage strategic planning and budgeting
- » ensure effective project development, reports and reviews
- » manage stakeholder liaison
- » oversee country manager relationships.

Importantly, the PRCs will also have a role as RPMs in managing their own discipline-based project portfolios (summarised as a matrix diagram in Figure 4), thus ensuring a close interaction between the four PRCs and the RPMs to enhance ACIAR's multidisciplinary research operations.

The new Principal Adviser, Strategy and Policy, position will also combine RPM responsibilities for policy R&D with a variety of strategic planning and budgeting activities. These will include working directly with the CEO to identify future corporate directions; management of impact and research evaluations; oversight of training and fellowship programs; and acting as a senior point of contact in inter-agency and government relations activities. The position also supports the CEO in managing ACIAR's expanding multilateral research agenda.

The primary role of the new Director Corporate position is to manage the provision of all corporate services for ACIAR to meet its corporate objectives and to discharge its responsibilities, including government and statutory reporting obligations. Key functions include:

- » corporate communications
- » human resource management
- » parliamentary and ministerial liaison
- » business and financial administration
- » corporate reporting
- » operational policy and procedures
- » support services for the Commission and Policy Advisory Council.

The new business model highlights the importance of both the regional and disciplinary aspects of ACIAR's work programs. The model has the flexibility to accommodate adjustments and tasking to meet new whole-of-government issues and the government's expanding aid program. It is also designed to work with an increased emphasis on multilateral project delivery and varied approaches for engagement with regional agricultural research organisations.

The structural changes will build onto and enhance ACIAR's in-house technical and development expertise and the Centre's responsiveness to new demands from stakeholders. It is tailored for enhanced, on-the-ground research impacts and capacity-building research delivery.

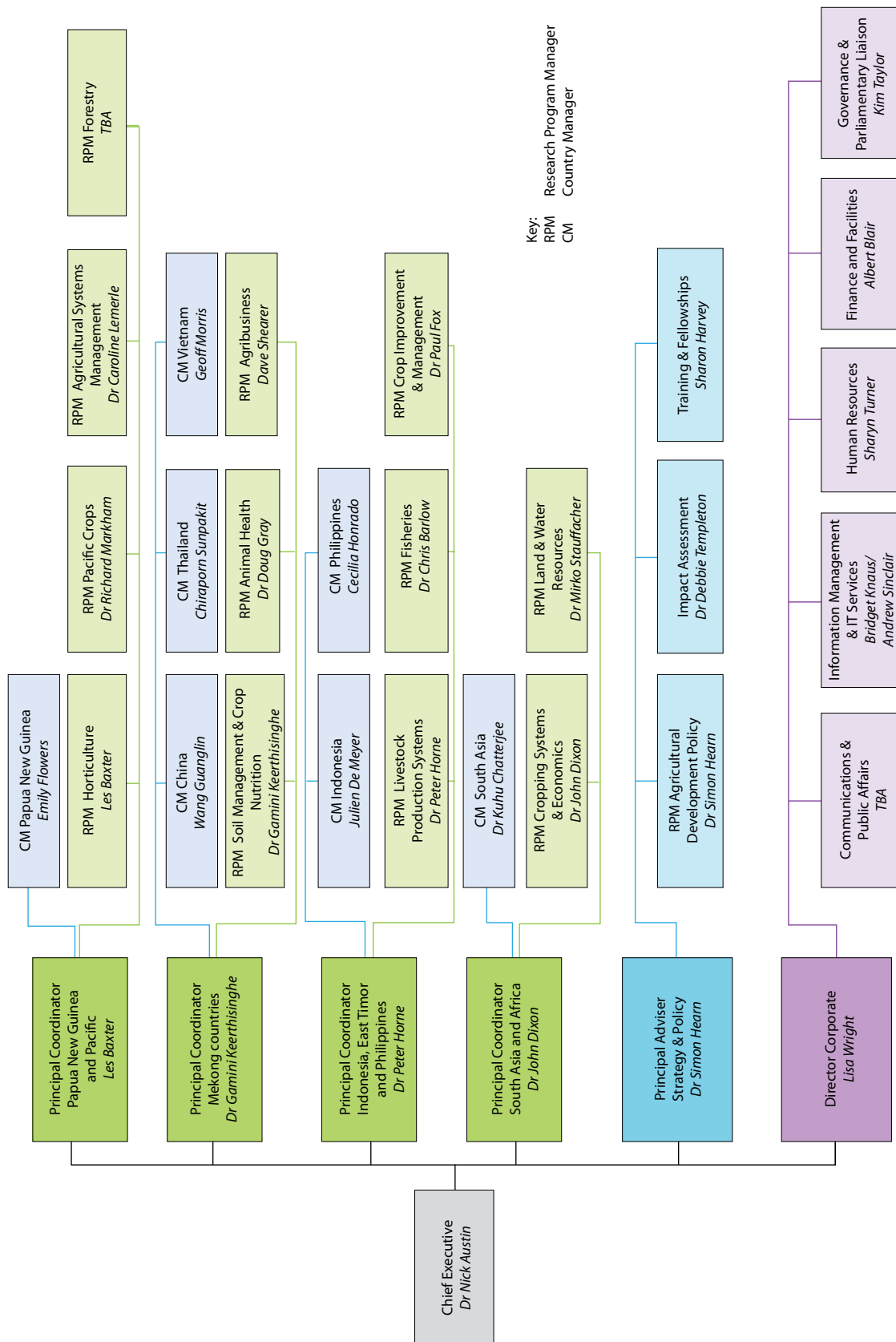


Figure 3. ACIAR organisational structure

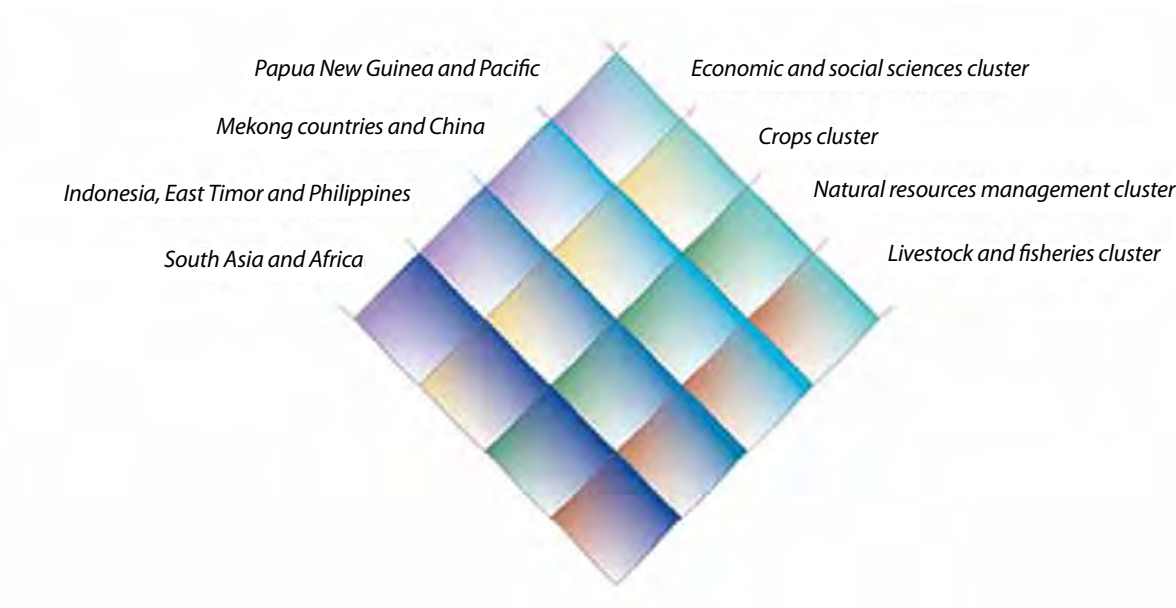


Figure 4. ACIAR operational structure

## Appendix 9: Acronyms and abbreviations

ACACA	Australia–China Agricultural Cooperation Agreement
ACIAR	Australian Centre for International Agricultural Research
ADP <sup>a</sup>	Agricultural Development Policy
AGB <sup>a</sup>	Agribusiness
AH <sup>a</sup>	Animal Health
AIPD-AVA	Australia–Indonesia Partnership for Decentralisation—Adding Value to Agriculture
AOP	Annual Operational Plan
APP	Asian Pacific Partnership on Clean Development and Climate
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASEM <sup>a</sup>	Agricultural Systems Management
ASLP	Agriculture Sector Linkages Program
ATSE	Academy of Technological Sciences and Engineering (Australia)
AusAID	Australian Agency for International Development
AVRDC	Asian Vegetable Research and Development Institute (Taiwan)
BADC	Brackishwater Aquaculture Development Centre
CABI	Centre for Agriculture and Biosciences International (UK)
CARDI	Cambodia Agricultural Research and Development Institute
CARF	Cambodia Agricultural Research Fund
CAVAC	Cambodia Agricultural Value Chain
CBB	coffee berry borer
CEO	Chief Executive Officer
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture (Colombia)
CIFOR	Center for International Forestry Research (Indonesia)
CIM <sup>a</sup>	Crop Improvement and Management
CIMMYT	International Maize and Wheat Improvement Center (Mexico)
CIP	International Potato Center (Peru)
CSE <sup>a</sup>	Cropping Systems Economics
CSF	classical swine fever
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
DAFF	Department of Agriculture, Fisheries and Forestry (Australia)
DFAT	Department of Foreign Affairs and Trade (Australia)
EPBC	Environment Protection and Biodiversity Conservation
FAO	Food and Agriculture Organization (of the United Nations)
FIS <sup>a</sup>	Fisheries
FMD	foot-and-mouth disease
FST <sup>a</sup>	Forestry
FTE	full-time equivalent (staff)
GDP	gross domestic product
GIS	geographic information system
GMO	genetically modified organism
GRDC	Grains Research and Development Corporation
HORT <sup>a</sup>	Horticulture
HPAI	highly pathogenic avian influenza
IARCs	International Agricultural Research Centres
IAS	Impact Assessment Series

ICARDA	International Center for Agricultural Research in the Dry Areas (Syria)
ICRAF	World Agroforestry Centre (Kenya)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics (India)
IDM	integrated disease management
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute (USA)
IITA	International Institute of Tropical Agriculture (Nigeria)
ILRI	International Livestock Research Institute (Kenya)
IRRI	International Rice Research Institute (Philippines)
ISL	International Science Linkages (program)
IUU	illegal, unreported and unregulated
IWMI	International Water Management Institute (Sri Lanka)
LARF	Lao Agricultural Research Fund
LIPI	Indonesian Institute of Sciences
LPS <sup>a</sup>	Livestock Production Systems
LWR <sup>a</sup>	Land and Water Resources
MAF	Ministry of Agriculture and Fisheries (East Timor)
NGO	non-government organisation
ODA	official development assistance
ODE	Office of Development Effectiveness
OIE	World Organisation for Animal Health
PARDI	Pacific Agribusiness Research for Development Initiative
PC <sup>a</sup>	Pacific Crops
PIC	Pacific island country
PNG	Papua New Guinea
PHAMA	Pacific Horticulture Agricultural Market Access
PRC	Principal Regional Coordinator
R&D	research and development
RPM	Research Program Manager
RSA	Republic of South Africa
SADI	Smallholder Agribusiness Development Initiative
SMAR	Support for Market-driven Adaptive Research
SMCN <sup>a</sup>	Soil Management and Crop Nutrition
SNRMPEP	Sustainable Natural Resources Management and Productivity Enhancement Project
SOL	Seeds of Life
SPC	Secretariat of the Pacific Community
USP	University of the South Pacific

<sup>a</sup> ACIAR research program