

# CAMBODIA

## Key statistics

<b>GDP per capita (US\$)<sup>a</sup></b>	769
<b>Population (million)<sup>a</sup></b>	15
<b>Funding</b>	<b>\$m</b>
2009–10 actual	3.30
2010–11 budget allocation	4.23
2011–12 budget estimate	5.04

<sup>a</sup> data from 2009 & 2010 <<http://unstats.un.org/unsd/demographic/products/socind/>>

*Cambodian smallholders in a rice field. Photographer: Coretext*

## MEDIUM-TERM STRATEGY

The Australian aid program to Cambodia will concentrate activities in four key areas: rural development, health, infrastructure, and law and justice. ACIAR's strategy is to support the rural development component in line with the Royal Government of Cambodia's development priorities as outlined in the National Strategic Development Plan (NSDP) 2006–2013. This plan brings together Cambodia's Millennium Development Goal (MDG) targets and the priorities of its national poverty reduction strategy.

Agriculture remains a significant part of the Cambodian economy, with about 80% of Cambodia's population and most of its poor relying on agriculture for their livelihoods. The agriculture sector remains highly relevant to Cambodian economic growth. The Cambodian agricultural production environment is, in general, harsher than the fertile lowlands of other countries in the region. Soils are generally poor, often becoming waterlogged during the wet season, and three-quarters of the agriculture is rainfed. The predominance of rice-based farming systems on infertile, poorly structured soils means that Cambodia has rather low agricultural productivity on both a labour and a land area basis.

ACIAR's program in Cambodia has three thrusts, all of which are in line with the Strategy for Agriculture and Water that has emerged from the NSDP. First, ACIAR supports research that aims to increase and secure the productivity of rice-based farming systems. This is important for both household food security and national and regional food production. Second, the strategy supports applied R&D that underpins agricultural diversification, particularly into non-rice field and horticultural crops and ruminant livestock. A third thrust recognises the vulnerability of Cambodian agriculture, particularly rainfed cropping, to climate variability and

change. A new program of research will assist adaptation to climate change at the farm scale, developing capacity for more-efficient use of soil and water resources.

ACIAR also places emphasis on research to underpin the development of suitable supply chains through participation in the Cambodia Agricultural Value Chain (CAVAC) program. ACIAR is managing the research and extension component of this 5-year, \$42 million program, which commenced in early 2009. CAVAC's goal is to accelerate growth in the value of agricultural production and smallholder incomes in selected provinces (Kampong Thom, Takeo and Kampot) through improved productivity of rice-based farming systems. Under CAVAC the AusAID and ACIAR co-funded research and extension component:

- funds and manages programs of priority research activities that address constraints in selected value chains
- implements a farmer extension program among participating water-user and agribusiness groups
- enhances the capacity of extension providers to transfer improved technologies and information to farmers
- develops and implements a partnership program linking researchers, extensionists, farmers and agribusiness
- assists in sustaining the operational capacity of the Cambodian Agricultural Research and Development Institute (CARDI).

ACIAR-managed work integrates with other CAVAC components, addressing agribusiness development, water management and irrigation, and the furthering of a business-enabling environment.

The Cambodian Agricultural Research Fund (CARF), established in 2002 with AusAID and ACIAR co-funding, continues under CAVAC, providing Cambodian scientists with opportunities to identify research priorities, design demand-driven agricultural research projects, compete for agricultural research funds and lead the selected projects. ACIAR's program has a focus on the southern provinces (Kampot, Takeo, Kandal, Prey Veng and Kampong Cham), two Tonle Sap provinces (Kampong Thom and Siem Reap) and two north-western provinces (Battambang and Pailin, mainly emphasising maize-based field crops). These provinces were selected on the basis of access to emerging domestic and international (Thailand, Vietnam) markets and as key production locations for the agreed priority crops and ruminant livestock.

Priorities for ACIAR–Cambodia cooperation are established through meetings between research program managers and executive staff at ACIAR and Cambodian agricultural R&D institutions, government departments and other organisations active in rural affairs. Effort is made to align the agreed priorities with the Strategy for Agriculture and Water 2010–2013.

Priorities for R&D cooperation—in production, protection, processing and marketing of field and horticultural crops—were discussed in February 2008 at a workshop in Phnom Penh jointly hosted by ACIAR and AusAID. It involved representatives of relevant national and provincial government ministries and agencies, universities, the private sector, NGOs and other donors. The full list of agreed priorities from the meetings is available at <aciarcambodia.gov.au> and includes:

- Securing productivity of rice-based farming systems:
  - » Development and diversification of rice varieties for lowland environments:
    - Use of improved varieties and robust production systems for direct-seeded rice
    - Breeding and agronomy of rice varieties for irrigated dry-season production
  - » Planting technologies and mechanisation of rice production:
    - Direct seeding—soil, weed and water management, and mechanisation
    - Synthesis of data on availability of soils, water resources, quality of groundwater, overall water supply and long-term climatic data to enable best-practice decision-making on selection of suitable sites and management of irrigation schemes
- Assessment of alternative business and institutional models for water-user groups
- Improvement in on-farm management of water in irrigated and rainfed systems, including in flood-recession rice systems
- » Soil and nutrient management:
  - Implementation of new techniques to increase soil organic matter content and reduce surface erosion
  - Assessment of the impact of long-term chemical and organic fertiliser use on rice yield, quality and soil properties
  - Implementation of crop management practices such as stubble retention and reduced tillage to reduce water loss and maintain soil health
- Income generation and better nutrition through agricultural diversification:
  - » Non-rice field crops:
    - Assessment of annual crops that support agroindustry, particularly maize, soybean and cassava
    - Study of soil suitability for upland crop production, including soil classification
    - Assessment of suitable environmental and soil conditions for reducing the risk of early wet-season soybean production before rice
    - Introduction of agronomically adapted cassava varieties suitable for food and processing applications, including studies of land preparation and soil nutrient management
    - Improvement in returns from field-crop marketing to value-chain participants
    - Synthesis and dissemination of supply systems, regulations and standards for field- and horticultural-crop seed, and cropping inputs to meet requirements of markets and trading partners
  - » Horticulture:
 

Priority crops for the domestic market include vegetables (leafy vegetables, chilli, crucifers, tomato), fruits (mango, papaya, rambutan, durian, banana) and black pepper, plus other potential new herb and spice products; for the export market, priority crops include chilli, black pepper and fruits (mango, papaya, rambutan and durian)

- Understanding domestic market needs and improving supply chains
- Development and dissemination of information on integrated crop production and postharvest management in selected vegetable crops
- Management of the economics of out-of-season vegetable production through protected cropping and containerised production systems
- Analysis of suitability of different soil types and on-farm water management, locations and systems
- Development of plant biosecurity, including biosecurity- and quarantine-related R&D, molecular identification of quarantine pests and technical capacity building
- » Ruminant livestock
  - Reduction of negative impact of trans-boundary diseases, particularly FMD, by managing livestock movements
  - Improvement in ruminant livestock health through integration of better nutrition, identification of diseases of importance to production, and treatments (including vaccination) for preventing and controlling key diseases
  - Management of cattle and buffalo production through improvements in reproduction and year-round availability of feedstuffs in rice-based farming systems
  - Development of market linkages for smallholder cattle and buffalo producers
- » Cambodian Agricultural Research Fund:
  - Support for research and extension in areas of agricultural diversification through CARF
- Helping Cambodian crop and livestock production systems respond to climate change:
  - » Research to assess adaptive capacity of smallholder farmers to climate variability and change
  - » Assessment of on-farm crop modelling to develop crop rotations that are better matched to shifting rainfall regimes
  - » Exploring the production of an additional crop in lowland rice-based cropping systems with better use of residual moisture, late-season rainfall or limited supplementary irrigation

- » Improving the capacity of poor communities dependent on aquatic resources in Laos and Cambodia to adapt to changing environmental conditions through fisheries and aquaculture.

## 2011–12 RESEARCH PRIORITIES AND PROJECTS

### Securing productivity of rice-based farming systems

Rice remains Cambodia's most important staple crop, occupying 90% of all agricultural land. While agricultural diversification is critical, farming families still emphasise the importance of rice food security at the household level. Cambodia is one of three countries participating in the Mekong–South Asia Food Security Research Program (see 'Highlights' section). Several CARF projects address alternative rice production systems and aim to optimise fertiliser use and postharvest technologies for rice in Cambodia.

#### ASEM/2009/023 (*proposed*) Agricultural policies for rice-based farming systems in Laos and Cambodia

The key objective is to analyse current agricultural strategies, policy processes and policy settings in Laos and Cambodia, in the context of regional, social, economic and environmental trends, in order to identify improved policy options and policy development processes.

#### ASEM/2010/049 (*proposed*) Integrating livestock into maize-based systems in north-western Cambodia

This project builds on earlier work in maize and legume systems, examining the potential role of livestock within such systems.

#### CSE/2009/005 (*multilateral, IRRI*) Improved rice germplasm for Cambodia and Australia

Following a market survey of desired rice characteristics, capacity for grain quality assessment will be developed in CARDI, and improved germplasm for different agroecologies in Cambodia and Australia will be developed. CAVAC will support dissemination of the new varieties through innovative extension in three target provinces.

#### CSE/2009/037 Improved rice establishment and productivity in Cambodia and Australia

This research will analyse, adapt and develop capacity for using existing machinery to allow farmers to better establish direct-seeded rice, with an emphasis on conservation agriculture practices, predominantly for dry-seeded rice. The project will identify appropriate water and nutrient management requirements and practices, and suitable non-rice crops, for different rice production systems.

**LWR/2009/046** Improved irrigation to increase crop productivity in Cambodia  
(Mekong–South Asia Food Security Research Program: component 4)

This project will increase understanding of water management and fertiliser issues in rice farming communities; improve water management practices; and enhance the skill base at scientific, extension and community levels.

**Income generation and better nutrition through agricultural diversification**

**Cropping systems**

This project cluster has two focal areas: (1) improvement of farming systems for upland non-rice field crops and integration of new marketing arrangements that assist smallholder farmers; and (2) establishment of vegetable supply chains (with particular emphasis on production and postharvest handling) for domestic markets. A range of CARF projects provide support for germplasm evaluation and additional assessment of farming systems for field and horticultural crops.

**CSE/2006/040** Development and intensification of rainfed lowland cropping systems in Cambodia

The research focuses on profitable double-cropping options for rice followed by mung bean, soybean or peanuts in the rainfed lowlands of three provinces. It will also identify productive water management practices for non-rice crops and estimate the level of risk under rainfed or supplementary irrigation.

**HORT/2006/107** Strengthening the Cambodian and Australian vegetable industries through adoption of improved production and postharvest practices

The project aims to develop integrated crop production and postharvest management packages in selected vegetable crops (tomato, chilli, sweet pepper and leafy vegetables) for adoption by growers and communities in Kampong Thom, Takeo and Kampot.

**HORT/2010/069 (proposed)** Developing plant biosecurity research and technical capability in the Mekong countries

This project aims to develop biosecurity R&D and technical diagnostic skills in Thailand, Laos and Cambodia to underpin development of potential international market opportunities for Mekong horticultural products. The project will build on previous work carried out in Thailand to develop a 'centre of excellence' that can act as a capacity-building and technical resource for other Mekong countries. In the first year it will concentrate on capacity building and network development.

**SMCN/2003/007** Cambodian Agricultural Research Fund (CARF)

CARF provides Cambodian scientists with opportunities to identify research priorities, design demand-driven agricultural research projects, compete for agricultural research funds and lead projects.

*Stephanie Belfield (front) and Cambodian participants during a soil management field day in Samlout, Cambodia*





*A Cambodian boy drawing water from a well and pump supplied through Australian aid. Photographer: Coretext*

### **SMCN/2010/085 (proposed) Profitable crop–livestock systems for Thailand, Cambodia and Laos**

The overall aim of this project is to examine the potential of alternative technologies to alleviate some of the current production constraints to increasing the profitability of rice-based farming and cattle production systems in rainfed lowland environments. The project will identify integrated management practices best suited to the local agroecological and socioeconomic conditions.

#### **Ruminant livestock**

Cattle and red meat are emerging as important products for Cambodia, both domestically and for trade with regional neighbours. An integrated program of animal health and production R&D in Cambodia has a special focus on ruminants. Diseases, reproductive management and nutrition are important constraints to the development of the large ruminant sector. A focal point is to improve year-round availability of feedstuffs for cattle in rice-based farming systems and also roll out an earlier International Center for Tropical Agriculture (CIAT) (Colombia) activity that developed forage banks in the wet season. CARF also funds some small, linked activities in ruminant nutrition, seeking to reduce the impact of trans-boundary diseases by managing livestock movements.

### **AH/2003/008 Improved feeding systems for more-efficient beef cattle production in Cambodia**

Feeding systems based on planted forages have been a significant success in Laos and offer the potential to transform smallholder-based cattle and buffalo production from a subsistence to a market-oriented activity. Based at the Department of Animal Health and Production, the project provides training in 10 provinces and engages with CARE International in their community projects.

### **AH/2005/086 Best-practice health and husbandry of cattle in Cambodia**

Cattle and buffalo are important to livelihoods of rural communities in south-eastern Cambodia and offer potential as income-generating enterprises. This project investigates village-based approaches to the biosecurity threats to these opportunities in Kampong Cham and Takeo provinces.

### **AH/2006/025 Understanding livestock movement and the risk of spread of trans-boundary animal diseases**

Livestock movement increases the risk of trans-boundary disease, but patterns of movement in the Mekong countries are poorly understood. This project focuses on livestock movements in and out of Laos and Cambodia, developing new methods to predict and track movement, including the use of livestock networks to acquire information and test disease control interventions.

### AH/2010/045 Sustainable assessment of livestock movement and disease risk in the Mekong region

Regional movement of livestock is associated with disease transmission, especially FMD in cattle and pigs and CSF in pigs. This project will develop improved methods to assess disease risk and strategies for disease control in the six countries of the AusAID-supported SEACFMD program: Laos, Cambodia, Vietnam, China, Thailand and Myanmar.

### AH/2010/046 Biosecurity-based approaches to cattle market development in south-eastern Cambodia

This new project will identify opportunities and risks associated with the market chains that link smallholder cattle production in south-eastern Cambodia with the Phnom Penh and Ho Chi Minh city markets.

### Helping Cambodian crop and livestock production systems respond to climate change

Cambodia is among the countries most vulnerable to climate change in Asia. It has high exposure to climate risks, including increased flooding in lowland areas, increased number of extreme weather events and shifts in seasonal weather patterns. The programs targeting climate change in Cambodia emphasise capacity building and social research to assess adaptive capacity. This is complemented by developing and testing adaptation options based on farming systems diversification and supplementary irrigation from both surface water and groundwater in lowland rice-based cropping.

### FIS/2010/058 (proposed) Strengthening resilience of fishery-dependent communities in Laos and Cambodia

The aquatic environment of the Mekong River system is changing due to infrastructure developments and the longer term effects of climate change. This project will move beyond questions relating to the direct effect of water management on fisheries, to help the poor and vulnerable communities of the basin adapt to changing environmental conditions.

### LWR/2008/019 Building capacity of farming communities in Cambodia, Lao PDR, Bangladesh and India to adapt to climate change

The project is building capacity of farming households in Svay Rieng to enable them to adapt their rice-based cropping systems to accommodate climate variability and change. It will also develop strategies to enable policymakers to deliver more-effective climate adaptation programs

#### Principal regional coordinator

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#### Key program managers

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 Dr John Dixon, Cropping Systems and Economics  
 Dr Doug Gray, Animal Health  
 Dr Caroline Lemerle, Agricultural Systems Management  
 Dr Andrew Noble, Land and Water Resources  
 Dr Craig Meisner, CAVAC–ACIAR research and extension manager (Phnom Penh-based)

#### Country manager

Khun Chiraporn Sunpakit

## KEY PERFORMANCE INDICATORS (2011–12)

- A new project developed to improve the resilience of fishery-dependent communities in Laos and Cambodia to possible changes in water regimes, either through natural or human causes
- A new project developed to integrate livestock within crop-based farming systems in north-western Cambodia
- Development of policy proposals to improve rice-based farming systems
- Management of CAVAC successfully integrated, complementing ACIAR and AusAID initiatives with respect to smallholder livelihoods
- Partnership created with regional institutions, OIE and SEACFMD, as well as with participating countries, to assess and control livestock biosecurity risks
- A new HORT project established to build capacity on plant biosecurity research in Cambodia, Lao PDR and Thailand
- Livestock traders educated to avoid high-risk practices that facilitate the spread of animal disease
- A series of policy briefs developed to assist authorities with the management of disease spread via livestock movement
- Enhanced capacity of farming households in Svay Rieng to enable them to adapt their systems to climate change