

# Cambodia



**A\$3.1** million  
Budgeted funding



**16**  
Bilateral and regional  
research projects



**5**  
Small projects and  
activities

Cambodia has one of the fastest growing economies in the world, but unequal distribution of economic gains means many Cambodians still struggle to access quality, affordable essential services. While poverty continues to fall, the rate of decline has slowed significantly.

The United Nations estimates that 13.5% of Cambodians live below the national poverty line, down from 53% in 2004. However, many Cambodian households, especially in rural areas, remain highly vulnerable. About 4.5 million people (approximately 28% of the population) remain near the poverty line and are vulnerable to falling back into poverty if exposed to economic and other shocks. Australian aid will continue to deliver development programs to improve infrastructure, increase farmers' incomes and deliver better-quality health and education outcomes.

An overview of Australia's aid program in Cambodia is available on the DFAT website.

**The Kingdom of Cambodia has more than 16 million people and accounts for 2% of the total population of the ASEAN region, placing it seventh (out of 10) among ASEAN member states. In 2018, Cambodia experienced accelerated growth of 7.5% but the economy is expected to register a return to its long-term potential of about 7% for 2019.**

According to the World Bank, Cambodia was the fastest growing country in East Asia and was among the few countries that performed better than forecast in 2018. Exports are the mainstay of Cambodia's economy, buoyed by stronger external demand. Foreign direct investment inflows grew by 24.8%, reaching a record high of more than A\$4.8 billion, or 13.4% of GDP, in 2018.

Around 80% of Cambodia's population lives in rural areas and agriculture remains the main source of employment. Poor rural households, which include most of the country's female-headed households, generally have little land and livestock, and food insecurity is a day-to-day reality. Weather conditions were again unfavourable in 2019-20, and agricultural production was affected by midseason drought and floods in some parts of the country.

Rice production, which accounts for about half of agricultural GDP, increased by 3.5%, which is lower than the 5.7% growth rate in 2017. Government statistics indicate that Cambodia's paddy rice surplus reached 5.8 million tonnes (or 3.7 million tonnes milled rice equivalent). Cambodia exports its rice surplus mostly in the form of paddy rice, while milled rice exports accounted for 0.6 million tonnes (or 16.7% of total surplus). In 2019, China increased its import quota for Cambodia's rice to 400,000 tonnes, up from 300,000 tonnes in 2018.

Given its location in the neighbourhood of agricultural commodity giants (Thailand and Vietnam), Cambodia has been strategically working towards quality differentiation (rice, pepper) while advancing agroprocessing capability (cashews, starch). At the same time, Cambodia is establishing its credentials for sustainability (green) and improved food safety (clean).

Women in Cambodia still dominate the secondary farm labour sector. Programs targeting women primarily focus on increasing their access to resources such as natural assets, technology, skills training and credit-based loans but to date have had little impact in promoting women's influence in changing land use and adoption of new technologies.

In 2019, the Ministry of Agriculture, Forestry and Fisheries launched its new five-year strategic plan (2019–2023) to develop farming and encourage the agriculture sector to modernise, become more competitive and more resilient to climate change, and to improve labour-intensive traditional practices. The strategic plan urges the creation of agricultural cooperatives and encourages farmers to cooperate with the private sector under an agricultural public-private partnership involving contract farming to ensure sufficient supplies, available markets and stable prices.

According to its new plan, the ministry will be supporting and encouraging the private sector, small- and medium-sized enterprises and development partners to invest in the processing sector to ensure sustainable, local productivity, stable markets and value-added products while promoting quality, sanitation and safety standards that comply with the demands of domestic and international markets. Around 95% of small- and medium-sized enterprises in Cambodia work directly with agriculture-related products.

## Country priorities

In November 2019, ACIAR and the Royal Government of Cambodia (represented by the Ministry of Agriculture, Forestry and Fisheries) signed a new 10-year agreement on the strategic priorities of its research collaboration. From 2019 to 2029, ACIAR and its Cambodian partners will focus research collaborations on three domains to support the development of Cambodian agriculture:

- » sustainable intensification and diversification of agriculture, focusing on non-rice crops in traditional crop-rice system and alternative cropping systems
- » sustainable intensification of market-oriented smallholder livestock production systems
- » sustainable intensification of freshwater aquaculture production systems for nutrition-rich species.

Research priorities over this time will also take into consideration cross-cutting themes that address challenges across the agriculture sector. These are:

- » gender equity, women's empowerment and nutrition—these are particularly important in the context of increasing labour migration that impacts women and children in rural Cambodia, and high rates of stunting and poor nutrition among women and children
- » climate variability mitigation and adaptation to climate change—taking into consideration climate variability and enabling climate-resilient farming systems
- » food safety and standards.

## 2020–21 research program

ACIAR supports 21 projects in Cambodia, six of which are specific to this country. The remainder are part of regional projects. The projects address our high-level objectives, as outlined in the 10-Year Strategy 2018–2027, as well as specific issues and opportunities identified by ACIAR and partner organisations.

The following sections briefly describe individual ACIAR-supported projects and anticipated outputs in Cambodia. The projects are grouped according to research program. Each project description is referenced in a list at the end of this section, which provides the project title and code.

### Agribusiness

Cassava witches' broom disease and Sri Lanka cassava mosaic virus are spreading rapidly. A project led by Dr Jonathan Newby of the International Center for Tropical Agriculture is developing technically viable and economically and socially sustainable ways to improve the resilience of cassava production systems and value chains in Cambodia, Laos, Myanmar and Vietnam. During 2020–21, the project will test and evaluate methods to slow the diseases, such as virus-free planting material and resistant varieties, and strengthen capacity and regional networks to reduce new pest and disease incursions.<sup>1</sup>

### Crops

Sustainable intensification and diversification of rainfed lowland rice production systems in north-western Cambodia has the potential to increase farm income and business resilience. Associate Professor Daniel Tan of the University of Sydney leads a project that has evaluated innovative crop management practices and high-value crops. Machine planting of direct-seeded rice using high-quality seed at lower seed rates that potentially leads to better crop establishment and production. It will give growers confidence to purchase more expensive but high quality seed. During 2020–21, the project will investigate scale-up and scale-out models for adoption at village and community level. Capacity-building activities with farming communities and tertiary agricultural education institutions will ensure implementation of new technologies beyond the life of the project.<sup>2</sup>

New crop establishment practices for rice, such as broadcasting and direct seeding (manually or mechanically), offer significant labour savings for growers. However, changed field conditions compared with traditional crop establishment methods, such as transplanting, increase the risk of weed infestations. A project in Cambodia and Laos, led by Dr Jaquie Mitchell of the University of Queensland, aims to develop weed management packages to address labour constraints and reduce the reliance on chemical control. New weed control options will enable rice farmers to adopt and benefit from mechanisation and sustainable intensification and conservation agriculture practices. Appropriate weed management will also improve grain quality and enable growers to participate in high-value markets.<sup>3</sup>

A new species of armyworm, the fall armyworm (*Spodoptera frugiperda*), has caused serious damage to rice, sugarcane, sorghum, beet, tomato, potato and cotton crops throughout the Indo-Pacific region, and individuals have been recorded in northern Australia. The species poses a serious challenge to smallholder farmers in terms of sustainable management practices. A small research activity, led by Dr Wee Tek Tay of CSIRO and co-funded with the Australian Grains Research and Development Corporation, will investigate current successful management options for the pest and determine genetic differences between populations of the pest in South-East Asia and Australia—particularly to understand existing levels of insecticide resistance. The knowledge generated will be useful for future integrated pest-management approaches and the development of a draft resistance management plan.<sup>4</sup>

### Fisheries

In Cambodia, about 80% of animal protein consumed originates from freshwater fisheries, which provides full-time and part-time work for about two million people. The development of finfish mariculture in Cambodia has been accelerated through a south-south cooperative research partnership with Indonesia in a project led by Professor Nicholas Paul and Dr Mike Rimmer of the University of the Sunshine Coast, and in partnership with Cambodian and Indonesian fisheries research organisations. Experienced researchers from Indonesia are training Cambodian researchers to gain skills in fish nutrition, hatchery production and fish health to support marine finfish aquaculture development in Cambodia.<sup>5</sup>

The south-south cooperative approach to capacity building in the previous project will be assessed for its potential application to other ACIAR projects. Professor Janelle Allison of the University of Tasmania is advising, facilitating and evaluating teaching approaches for achieving innovative and effective south-south collaboration, which could be applied to future agricultural research and development in the Indo-Pacific region and elsewhere.<sup>6</sup>

Across South-East Asia, as floodplains are developed for irrigation and river flows are regulated, river communities are at risk of losing fishing income and an important source of protein and essential nutrients. Previous ACIAR projects showed that fishways, which facilitate passage of migratory fish up and down regulated rivers, can have lasting economic and social benefits for river communities. Professor Lee Baumgartner of Charles Sturt University is leading a project to develop a platform for sound decision-making on fish passage construction programs across South-East Asia, a targeted capacity-building program to address institutional needs for the integration of fish passages into irrigation infrastructure and guidelines for the development of fish passage policy and legislation in Cambodia, Laos, Myanmar and Indonesia.<sup>7</sup>



Poultry enterprises are a way to improve the nutrition of poor households, while economically empowering women, who are the key custodians of poultry. Photo: Majken Søgaard. ACIAR project: LS/2019/142.

### Forestry

A small research activity, headed by Dr Madaline Healey of the University of the Sunshine Coast, has gathered data from the ASEAN countries around priorities, capacities and perceived risk pathways in forest biosecurity. Biosecurity investment and biosecurity regulations within the region are being reviewed. These analyses will underpin initiation of a regional biosecurity network that will link the agriculture and forestry agencies of the national partners.<sup>8</sup>

Regional collaboration in South-East Asia is urgently needed to create a unified network capable of a coordinated response to forest pest and disease incursions. This new project, led by Professor Simon Lawson of the University of the Sunshine Coast, aims to foster such a network. The project will reduce the risk of forest pest and disease incursion and the impacts of established pests and diseases by developing enhanced techniques and capacities in pest risk analysis, surveillance and diagnostics and deploying these through the regional network. Research results will support evidence-based forest biosecurity policy for the region.<sup>9</sup>

### Horticulture

Mango production in the Asia-Pacific region accounts for about two-thirds of global production. Much of the crop is produced by smallholders, who achieve relatively modest yields and participate in traditional value-chain arrangements that offer producers little incentive to innovate or pursue higher quality. Some producers seek better returns by supplying higher-value export markets (such as Korea), but they have struggled to deliver fruit that meets market or regulatory standards. A project in Cambodia and the Philippines, led by Dr Cameron McConchie of the Northern Territory Department of Primary Industry and Fisheries, aims to improve the ability of selected mango supply chains to deliver fruit that better meets consumer expectations of high quality and value, and provide smallholder growers with a better return on investment.<sup>10</sup>

## Livestock Systems

A stocktake of the potential of forage production by smallholders in Cambodia, Laos and Vietnam is the focus of a small research activity that concludes in 2020. Dr Lava Yadav of the University of Queensland has analysed factors that contribute to, and constrain, forage production and development of related enterprises. The work will report on the constraints and opportunities for more effective uptake and use of forages and identify potential business models for more demand-driven development.<sup>11</sup>

Several issues threaten regional, and potentially global, health security in the Mekong region: economic growth rates among the fastest in the world, marked climate and other environmental disruptions, and shifting human and animal geographies. Recent zoonotic disease outbreaks such as severe acute respiratory syndrome (SARS) and highly pathogenic avian influenza can be attributed to these converging issues. A major constraint to the development of the One Health agenda in the region is the capacity of veterinary systems. Professor Barbara McPake of the Nossal Institute for Global Health leads a project to understand the opportunities to improve collaboration between human and animal health sectors and use incentive-based regulation to intervene in veterinary markets in Cambodia to improve health security outcomes.<sup>12</sup>

Poultry enterprises are increasingly recognised as a way to improve the nutrition of poor households, while economically empowering women, who are the key custodians of smallholder poultry. However, low-producing chicken genotypes typically dominate smallholder or family production systems. Dr Tadelles Dessie of the International Livestock Research Institute will lead a new project that aims to test and make available high-producing, farmer-preferred genotypes of chickens to increase smallholder productivity as a pathway out of poverty in Cambodia, Myanmar and Vietnam. The project will also strengthen the capacity of young scientists in the project countries to conduct high-quality research on village poultry systems to benefit smallholder farmers in their countries.<sup>13</sup>

There is an urgent need to consolidate existing evidence and identify gaps in global research to demonstrate the scale of reductions in greenhouse gas emissions that occur with more efficient livestock production systems. Using the expertise and capabilities of Australian and New Zealand climate science, Dr Paul (Long) Chen of the University of Melbourne will lead a new project developing methods and models that apply to livestock development projects to quantify real and potential reductions in emissions and determine the opportunities and trade-offs between productivity gain and economic returns. The results will help determine if greenhouse gas offsets can be captured and linked with nationally determined contributions of partner countries, and if there is potential for voluntary carbon-credit trading to diversify smallholders' income.<sup>14</sup>

## Social Sciences

A farmer's decision to adopt an agricultural technology or practice involves technical, local, financial, contextual and personal factors. Efforts to encourage adoption must therefore prioritise analysis of problems and solutions. A project led by Dr Brian Cook of the University of Melbourne has determined problem-solution pathways, which emphasise the everyday influences that ultimately determine adoption. The project is investigating the adoption of technologies and best practice for sustainable cassava production in north-western Cambodia, where the crop area is rapidly expanding and market returns are high. During 2020–21, the project will measure the adoption of agricultural technologies to explain why some groups adopt, and identify barriers specific to poor, marginalised and female-headed households.<sup>15</sup>

A project starting in 2021, also led by Dr Brian Cook of the University of Melbourne, will build on the findings from the previous project that extension does not overcome powerful social relations, especially credit and debt. This project will analyse the social relations that farmers actively avoid, wish to avoid, or prefer and wish to strengthen as part of self-determined efforts to improve their livelihoods. Ultimately, the project seeks to define pathways that support farmers to benefit from agricultural development.<sup>16</sup>

With the rapid growth of the cassava sector across South-East Asia, various arrangements emerged between industry and smallholder farmers, varying from large estates to smallholder-oriented models. There are considerable opportunities to increase the productivity, profitability and sustainability of the cassava industry. Dr Dominic Smith of the University of Queensland will complete a project in 2020 that has identified the socioeconomic conditions under which improved technology and market booms in commercial crops, such as cassava, can be harnessed to increase the profitability and sustainability of smallholder farming systems.<sup>17</sup>

Previous ACIAR work reported that turning research into practical innovation is increasingly challenging in an era of accelerating global resource demand and climate change, creating an imperative for transformational change across farms, landscapes, markets, institutions and populations. A small research activity will generate practical insights and actionable recommendations for ACIAR programs to better integrate agricultural practice change and community engagement. Dr Mary Johnson of RMIT University will lead a literature study from the Mekong region, comparing and contrasting public health promotion approaches and agricultural extension to find practical lessons and areas for cross-disciplinary learning and innovation. A diagnostic framework and supporting resources will be produced for use by ACIAR to assess project proposals to ensure that agricultural practice change and community engagement are at, or redefining, the cutting edge of agricultural extension.<sup>18</sup>

## Soil and Land Management

Practices to increase the overall productivity of crop-livestock systems in rice-growing areas of Cambodia and Laos were investigated in a project led by Dr Matthew Denton of the University of Adelaide. The project will report on soil and water management practices to improve sustainability, productivity and profitability, and on social and economic impacts of adoption of forages. Farmers will be provided with practical information and technologies from the research, and local scientists and extension officers are being trained to conduct ongoing research and promote outcomes.<sup>19</sup>

Continued expansion of cultivation into unused or degraded land has been recognised as environmentally unsustainable by the Royal Government of Cambodia. Sustainable intensification, improved yields and diversification of cropping is a priority in areas where upland farming is being developed. A project led by Dr Wendy Vance of Murdoch University focuses on understanding indigenous soil knowledge and suitable land use to determine site-specific soil management. The project concludes in 2021 with the delivery of simple tools to help farmers identify soil types and constraints, and soil data to be added to the Cambodian Agronomic Soils Classification system and FAO World Reference Base for Soil Resources.<sup>20</sup>

A small research activity will consolidate findings from ACIAR investments in sustainable intensification of agriculture in Cambodia at the program and cross-program level. Dr Davina Boyd of Murdoch University leads the project that will produce a synthesis of the major insights from ACIAR investment in sustainable intensification in Cambodia, and facilitate multidisciplinary cross-project research and capacity-building activities that build on, develop or combine project insights, tools and approaches relating to sustainable intensification of agriculture.<sup>21</sup>

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See page 209 for contact details



ACIAR supports research to enable farmers to grow profitable crops with less water. Cambodian rice farmer, Phoun Phall, discusses his experience of growing forages instead of rice on his land, with Lim Vandy from CARDI. Photo: Majken Søgaard. ACIAR project: SMCN/2012/075.

## Current and proposed projects

1. Establishing sustainable solutions to cassava diseases in mainland South-East Asia [Cambodia, Laos, Myanmar, Vietnam] (AGB/2018/172)
2. Sustainable intensification and diversification in the lowland rice system in Northwest Cambodia (CSE/2015/044)
3. Weed management techniques for mechanised and broadcast lowland crop production systems in Cambodia and Laos (CROP/2019/145)
4. Characterisation of *Spodoptera frugiperda* (fall armyworm) populations in South-East Asia and northern Australia (co-funded with GRDC) [Indonesia, Vietnam, Laos, Myanmar, Cambodia, Philippines, Malaysia] (CROP/2020/144)
5. Accelerating the development of finfish mariculture in Cambodia through south-south research cooperation with Indonesia (FIS/2016/130)
6. Evaluating processes and outcomes in south-south research collaboration—finfish mariculture development in Cambodia through cooperation with Indonesia (FIS/2018/115)
7. Translating fish passage research outcomes into policy and legislation across South-East Asia [Cambodia, Indonesia, Laos, Myanmar] (FIS/2018/153)
8. Scoping for a forest biosecurity network in South-East Asia [Cambodia, Laos, Vietnam] (FST/2020/102)
9. Building effective forest health and biosecurity networks in South-East Asia [Cambodia, Laos, Vietnam] (FST/2020/123)
10. Integrated crop management for mango in Cambodia and the Philippines to meet market quality standards (HORT/2016/190)
11. Forages—taking stock and identifying research needs [Cambodia, Laos, Vietnam] (LS/2018/186)
12. Collaboration on One Health economic research for systems (One Health) [Cambodia] (LS/2019/118)
13. Asian chicken genetic gains: a platform for testing, delivering, and improving chickens for enhanced livelihood outcomes in South-East Asia [Cambodia, Myanmar, Vietnam] (LS/2019/142)
14. Value-adding to existing livestock programs to understand and quantify the implications of greenhouse gas emissions, provide options for emissions reduction and inform in-country policy development [Cambodia, Ethiopia, Indonesia, Laos, Myanmar, Pakistan, Tanzania, Timor-Leste, Vanuatu, Vietnam, Zambia] (LS/2019/159)
15. Uptake of agricultural technologies amongst farmers in Battambang and Pailin provinces, Cambodia (ASEM/2013/003)
16. Next generation agricultural extension: social networks for practice change [Cambodia] (SSS/2019/138)
17. Developing cassava production and marketing systems to enhance smallholder livelihoods in Cambodia and Laos (ASEM/2014/053)
18. A framework for assessing agricultural extension approaches and an analysis of transferrable public health approaches [Australia, Cambodia, Laos, Myanmar, Thailand, Vietnam] (SSS/2019/186)
19. Management practices for profitable crop-livestock systems for Cambodia and Laos (SMCN/2012/075)
20. Land suitability assessment and site-specific soil management for Cambodian uplands (SMCN/2016/237)
21. Synthesis of learnings on sustainable intensification of agriculture in Cambodia from ACIAR research investments to inform the future and support impact (SLAM/2018/127)

