Cambodia

A$3.66 million
Budgeted funding

14
Bilateral and regional research projects

3
Small projects and activities

In late 2021, the Kingdom of Cambodia declared it would live with COVID-19, and reopened the country to business and tourism. While health measures remain in place, Cambodia has initiated its economic recovery plan.

Cambodia has suffered critical shocks triggered by the global pandemic, and the economic impacts have been as severe as the health impacts. The GDP is however predicted to recover with growth of greater than 6% anticipated for 2023.

Poverty remains higher than pre-pandemic levels, with the lowest rate in Phnom Penh (4.2%) and the highest rate in rural areas (22.8%). About 76% of Cambodia's population lives in rural areas.

Cambodia's agricultural sector remains a key source of employment and accounted for approximately a quarter of the country's GDP in 2021. More than 60% of poverty reduction from 2007 to 2011 was attributed to positive developments in the agriculture sector and in 2020 the World Bank reported that it is the sector least affected by the global pandemic.

Recently, the Cambodian Minister of Agriculture, Forestry and Fisheries stated that 2 of the challenges Cambodia faces include the impact of severe droughts and floods, which increasingly threaten yields and incomes each year. According to the Global Climate Risk Index for 2000–2019, Cambodia ranked 14th in the world for countries most affected by climate-related extreme weather events.

Cambodia's agricultural production increased slightly in 2021, despite less favourable weather conditions. Wet season rice cultivation reached 2.6 million hectares, a 5.4% year-on-year increase. Wet season rice yield increased to 4.1 tonnes per hectare, up from 3.5 tonnes per hectare in 2020. Throughout the pandemic, the agriculture sector has benefited from increased labour availability due to layoffs in the services and industry sectors and the return of migrant workers from cities and abroad.

The Cambodia–China Free Trade Agreement came into effect in January 2022 and will likely provide a further boost to Cambodia's agricultural production and exports, especially to the Chinese market. The country's agricultural production and exports have expanded during the pandemic as demand increases.

The Ministry of Agriculture, Forestry and Fisheries is in the midst of implementing its 2019–25 Agriculture Sector Development Strategy, which aims at modernising the agriculture sector. This is an important step towards accelerating the transformation from subsistence farming to commercial agriculture.

Country priorities

ACIAR and the Royal Government of Cambodia (represented by the Ministry of Agriculture, Forestry and Fisheries) have an ongoing 10-year agreement on the strategic priorities for research collaboration. From 2019 to 2029, research collaborations will focus on 3 domains to support the development of Cambodian agriculture:

- sustainable intensification and diversification of agriculture, focusing on non-rice crops in traditional crop-rice systems 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.

2022–23 research program

- **17 ACIAR-supported projects in Cambodia**
- **4 projects are specific to this country**
- **13 projects are part of regional projects**

The research program addresses our high-level objectives, as outlined in the ACIAR 10-Year Strategy 2018–2027, as well as specific issues and opportunities identified by ACIAR and our 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 in South-East Asia. 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. The project will conclude in 2023 with researchers continuing on-farm testing of new agronomic practices and training of farmers and extension officers. The project team will also finalise their investigation of alternative models for public-private funding for core activities.[1]

Ms Pou Chanthea is a cassava farmer in Tboung Khmum province in central Cambodia. ACIAR-supported projects are working with farmers and agencies to identify and introduce agronomic practices and value chain management to reduce the impact of disease in cassava crops. Photo: Majken Soegaard

Catfish (*Pangasius* sp) farming and wild-caught catfish are important income generating activities for smallholder farmers in the Mekong River Basin and are a vital source of dietary protein for those countries' populations. The continued availability of catfish for human consumption is influenced by many factors including climate change, the COVID-19 pandemic, consumer perceptions on food and health safety provenance, and environmental and political changes. Dr Van Kien Nguyen of the Health and Agricultural Policy Research Institute leads a new project in Cambodia, Laos and Vietnam to identify food loss and waste along the catfish value chain; conduct foresight exercises to determine the uncertainties of catfish production for food systems; and develop solutions to reduce food loss in catfish production. This project is part of the ACIAR–IDRC Food Loss Research Program (page 23).[2]

Crops

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, is developing weed management packages to address labour constraints and reduce the reliance on chemical control. The project is engaging with farmer groups and their advisers to determine knowledge gaps in weed management, and identify practical solutions to develop integrated weed management packages suitable for rainfed lowland rice production systems, specific to locations.[3]

Fisheries

Floodplain development and the regulation of river flows for rice production across South-East Asia are affecting fisheries and fish migration, and the livelihoods of communities that depend on fish for protein and trade. Previous ACIAR-supported research showed that integrating fishways into water regulator designs, allowing 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 leads a project to establish a stakeholder network to facilitate sound, cross-sector decision-making on fish passage construction programs across South-East Asia. During 2022–23, researchers will continue gathering data on fish migration and undertake an international review of draft guidelines and curriculum for a specially designed Graduate Certificate in Fisheries. An additional DFAT investment aims to broaden the projects outcomes to include scaling of fish passage technologies across Mekong countries.[4]

Forestry

Increased trade, global movement and a changing climate increase the threat of emerging pests and diseases. The capability to detect and respond to forest pest and disease incursions is crucial to minimising their impacts. In South-East Asia, this capacity varies widely, but there is a general lack of preparedness. A project co-led by Dr Madaline Healey and Associate Professor Simon Lawson of the University of the Sunshine Coast will establish an effective and sustainable forest biosecurity network to improve risk management for invasive forest pests and diseases. The project will use shared field protocols and data as an entry point and foundation for coordinated biosecurity response. In 2022–23 activities will include launching resources to assist with in-country identification of pests and pathogens and delivering biosecurity awareness training.[5]

University of Queensland researchers are working with farmer groups and their advisers to develop integrated weed management packages suitable for rainfed lowland rice production systems. Photo: Sarina McFadyen

ACIAR-funded cattle research in Cambodia and Laos since the early 2000s will be reviewed to understand its relevance and application to the rapidly changing beef sector in the Mekong region. Photo: Harry Campbell-Ross

Horticulture

Appropriate low-cost protected cropping provides an opportunity to develop inclusive economies around vegetable production using collaborative supply chains to grow and market traceable, safe, fresh vegetables. A new project led by Mr Jeremy Badgery-Parker of the University of Adelaide will address the technical and social challenges of year-round safe, reliable vegetable production through understanding the inputs and outputs of these production systems. The project will support smallholder farmers in Cambodia and Laos to be climate-resilient, sustain natural landscapes, minimise waste and emissions, and significantly increase yields leading to increased income.[6]

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 little incentive to innovate or pursue higher quality. Some producers seek better returns by supplying higher-value export markets (such as Korea), but struggle to deliver fruit that meets market or regulatory standards. Dr Muhammad Sohail Mahzar of the Northern Territory Department of Primary Industry and Fisheries Industry, Tourism and Trade will lead a new project in Cambodia and the Philippines that aims to improve the ability of selected mango supply chains to deliver fruit that better meets consumer expectations of quality and value, and provide smallholder growers with a better return on investment.[7]

High-value vegetable crops are essential to improving livelihoods in the Pacific region and Cambodia. Extension services are not well equipped to assist farmers in dealing with pests and diseases, with insufficient staff training resulting in losses of up to 30–40%, primarily due to pests and diseases. Plant health clinics offer a solution to this problem. A new project led by Dr Michael Furlong of the University of Queensland will establish an effective information system supported by research on key emerging pests in these regions to better prepare farmers to detect, respond to and continue to manage their farming businesses, all the while contributing to regional biosecurity preparedness.[8]

Livestock Systems

ACIAR has funded cattle research in Cambodia and Laos since the early 2000s. Despite this significant investment, the research outcomes have not been reflected in more significant development initiatives or government programs, which is a potential wasted opportunity for research impact. Furthermore, in the case of Laos, the Mekong beef sector has changed dramatically in the last 5 years, requiring an assessment of where existing research is relevant and what new research is needed. A new project led by Dr Rodd Dyer of FocusGroupGo Asia Pacific aims to assist in understanding the rapidly evolving situation in northern Laos beef markets. Researchers will identify areas where previous ACIAR-supported research could be valuable and future research areas in broader livestock investments.[9]

Poultry enterprises offer opportunities to improve the nutrition of households and economically empower women, who are the key custodians of smallholder poultry in South-East Asia. However, low-producing chicken genotypes typically dominate smallholder or family production systems. Dr Tadelle Dessie of the International Livestock Research Institute leads a project to test and make available high-producing, farmer-preferred genotypes of chickens to increase smallholder productivity as a pathway out of poverty in Cambodia and Vietnam. During 2022–23, the project continues activities to quantify smallholder chicken production systems and investigate promising breeds for the region. The project is also designing a breed improvement program in Cambodia.[10]

Social Systems

A farmer's decision to adopt an agricultural technology or practice involves technical, local, financial, contextual and personal factors. Therefore, efforts to encourage adoption must prioritise farmers' perceptions of problems and solutions. A project led by Dr Brian Cook of the University of Melbourne has investigated the adoption of technologies and best practice for sustainable cassava production in north-western Cambodia, where the crop area is expanding rapidly and market returns are high. The final stage of the project will be completed in 2022 with the analysis of household interviews and village engagement activities. This will inform understanding of why some groups adopt new technologies, and identify barriers specific to poor, marginalised and female-headed households.[11]

The previous project found that extension does not overcome powerful social relations, especially credit and debit. Dr Brian Cook of the University of Melbourne leads a new project to 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. In 2022–23, the project team will collect qualitative data by engaging with 2,100 households across 30 villages.[12]

In Laos and Cambodia, access to formal financial services is low. It is substantially lower among rural and remote communities, and lower again for women. Dr Erin Taylor of Western Sydney University leads a project that will review theoretical frameworks to understand how the approach to digital financial services in Laos and Cambodia compares with global trends, and what global lessons can be applied. The project will assess theories of change and impact methodologies that have been used around the world to introduce digital financial services to reduce poverty in rural areas and improve gender equality. In 2022–23 the project team will begin gathering qualitative data through focus groups and in-depth interviews with key informants.[13]

A new project will be established in Cambodia during 2022–23, as part of the ACIAR–IDRC Research Program on One Health. Led by the Royal University of Agriculture (Cambodia), the project will investigate the role of agricultural and forest landscapes on human and environmental health in Cambodia (page 24).[14]

Soil and Land Management

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 are priorities 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 develop site-specific soil management practices. The project concludes in 2022 with the delivery of simple tools to help farmers identify soil types and constraints, and soil data will be added to the Cambodian Agronomic Soils Classification system and the FAO World Reference Base for Soil Resources.[15]

The Cambodian upland landscape suffers from periods of drought, making rice farming difficult. ACIAR-supported research is enabling farmers to grow profitable crops with less water, such as rice farmer Phoun Phall, who is experimenting with growing forages instead of rice on his land. Photo: Majken Soegaard

Agricultural production in the lowlands of Cambodia and Laos is characterised by a high proportion of each nation's poorest and most food-insecure people. Their livelihoods generally rely on rainfed, low-input rice production and limited livestock keeping. A project led by Dr Matthew Denton of the University of Adelaide aims to strengthen and scale out knowledge that supports smallholder farmers in lowland areas to develop integrated forage systems on sandy soils. In 2022–23, the project team will translate their research results and information on best management practices for forages into easily understood and adoptable guidelines. They will seek to extend the knowledge gained through this project to farmers, extension agents and other stakeholders in livestock production value chains in Laos and Cambodia.[16]

Water

Inland fisheries in South-East Asia have declined significantly in recent years due to the cumulative impacts of development on freshwater ecosystems. Solutions to integrate fisheries and irrigation need to consider engineering, agronomic, environmental and social interventions, and operate across scales from field to river basin. A scoping study, led by Mr Tarek Ketelsen of the Australia Mekong Partnership for Environmental Resources and Energy Systems, aims to establish an approach for communities in the Mekong region of Cambodia and Laos to co-design interventions and systems to integrate fisheries and irrigation for more sustainable and equitable outcomes. The study forms the basis for a major project to examine integration of fisheries and irrigation in a wide range of farming systems and social contexts across South-East Asia (Cambodia, Laos, Myanmar); linking with current work on fishways and broadening the focus to include threats beyond water control infrastructure.[17]

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Current and proposed projects

1. Establishing sustainable solutions to cassava diseases in mainland South-East Asia [Cambodia, Laos, Myanmar, Vietnam] (AGB/2018/172)
2. Food loss in the *Pangasius* catfish value chain of the Mekong River Basin (Food Loss Program) [Cambodia, Laos, Vietnam] (CS/2020/209)
3. Weed management techniques for mechanised and broadcast lowland crop production systems in Cambodia and Laos (CROP/2019/145)
4. FishTech: Integrating technical fisheries solutions into river development programs across South-East Asia [Cambodia, Indonesia, Laos, Vietnam, Thailand] (FIS/2018/153)
5. Building an effective forest health and biosecurity network in South-East Asia [Cambodia, Indonesia, Laos, Vietnam] (FST/2020/123)
6. Safe, fresh, year-round vegetables in Cambodia and Laos through research and development support of whole supply chain agribusiness networks (HORT/2021/143)
7. Improving mango crop management in Cambodia, the Philippines and Australia to meet market expectations (HORT/2016/190)
8. Biosecurity planning [Cambodia, Papua New Guinea] (HORT/2021/151)
9. Rapid transformation of Lao beef sector - biosecurity, trade and smallholders [Cambodia, Laos] (LS/2021/128)
10. Asian chicken genetic gains: A platform for exploring, testing, delivering, and improving chickens for enhanced livelihood outcomes in South East Asia [Cambodia, Vietnam] (LS/2019/142)
11. Uptake of agricultural technologies amongst farmers in Battambang and Pailin provinces, Cambodia (ASEM/2013/003)
12. Next generation agricultural extension: social relations for practice change [Cambodia] (SSS/2019/138)
13. Building the evidence base on the impacts of mobile financial services for women and men in farming households in Laos and Cambodia (SSS/2020/160)
14. The role of agricultural and forest landscapes on human and environmental health in Cambodia (ACIAR–IRDC One Health Research Program) (SSS/2022/164)
15. Land suitability assessment and site-specific soil management for Cambodian uplands (SMCN/2016/237)
16. Management practices for profitable crop livestock systems for Cambodia and Laos (SMCN/2012/075)
17. Water for fish and irrigation in the Mekong [Cambodia, Laos] (WAC/2021/135)