


Laos

 **A\$4.2** million
Budgeted funding

 **16**
Bilateral and regional
research projects

 **4**
Small projects and
activities

The Lao economy has been slowed by containment measures introduced to address a second wave of COVID-19. The economic consequences of the pandemic exposed existing vulnerabilities and the country slumped into recession for the first time in more than 20 years.

Up until mid-April 2021, Laos had one of the region's lowest rates of COVID-19 cases. However, the second outbreak led to the re-introduction of containment measures that have lasted longer than those introduced in 2020. These measures restrained mobility and affected economic activities. According to the World Bank, livelihood recovery in Laos had been robust, but largely imbalanced, before the second wave of COVID-19 hit.

In its August 2021 Economic Monitor, the World Bank cited that the Lao labour market had recovered from the first wave of COVID-19, primarily driven by the ability of the agriculture sector to absorb the surplus workforce affected by pandemic shocks. Agriculture proved more resilient to pandemic shocks compared to other sectors. However, the restrictions on mobility disrupted farming activities among 14% of farming households. Because of this, more than 25% of households were very concerned about food insecurity for people in their community, an increase from 16% before the second wave began.

The World Bank expects growth in agriculture to be strong due to external demands from neighbouring countries, including China. Agricultural output was projected to grow by 3.9% in 2021, relatively higher than the 3.2% in 2020. Expanded production and export of primary agricultural products such as banana, cassava, coffee beans, live animals and rubber will drive growth. These products accounted for nearly 90% of agricultural exports in January-May 2021.

Crops and livestock farming are key drivers for future agricultural growth. In addition, the agriculture sector will continue to absorb labour that left other sectors due to the pandemic. In late 2021, the Lao-China Railway started operating. The 414 km railway is part of the Belt and Road Initiative and is expected to increase trade flows (with estimates of almost 4 million tonnes of transit trade per year by 2030), attract more foreign investors, create new jobs, and accelerate economic growth in Laos. There are high expectations that the railway will contribute to improved transportation of farm products from Laos to China.

After the 2021 UN Food Systems Summit, the Ministry of Agriculture and Forestry launched a report, Pathways to Sustainable Food Systems, which identifies 4 critical thematic areas on which the Ministry will focus. One of these is related to boosting nature-positive production, which revolves around balancing sustainable agricultural practices, people's livelihoods, and economic competitiveness with neighbouring countries. This is consistent with earlier statements of the Ministry on building its reputation for having relatively green and clean agriculture products free from the chemicals used to produce many farm products in the region.

Country priorities

In 2022-23, ACIAR will recalibrate its long-term strategic program priorities based on consultation with Lao stakeholders. The strategic priority outcomes that currently guide our investments in Laos are:

- » efficient and sustainable forestry industries, including non-timber products, with suitable climate-change resilience
- » innovative livestock systems that allow for intensification and land-use requirements, while raising animal health and biosecurity levels
- » increased fish habitat restoration and protection of fish migration routes
- » cost-effective and sustainable rice-based farming systems, through mechanisation, diversification and intensification, along with better crop quality, quarantine standards and value-adding for domestic and export markets
- » improved natural resource management that benefits livelihoods and food security by delivering land-use options to smallholders, with attention to both water and nutrient management within climate-change adaptation
- » improved institutional training and communication frameworks that enable smallholders to adopt and adapt new technologies, and increase the capacity development of researchers and educators.



2022-23 research program

- » **20 ACIAR-supported projects in Laos**
- » **5 projects are specific to this country**
- » **15 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 Laos. 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

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

ACIAR funds several projects to improve the productivity and resilience of cassava production systems and value chains, as cassava mosaic virus continues to affect crops across South-East Asia.

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



ACIAR-supported research has 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.

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

The Xayaburi Power Company, responsible for designing and constructing the Xayaburi hydro-electric dam across the Mekong River in Laos, built a complex fishway system designed to enable the upstream and downstream passage of migratory fish. There are hundreds of species of fish in the Mekong River, varying in size from a few centimetres to more than one metre. A project team led by Professor Lee Baumgartner of Charles Sturt University is working with the Xayaburi Power Company to develop robust tools and techniques to assess the effectiveness of the Xayaburi Dam fish passage facilities and provide a standard for other hydro-electric dams planned for the mainstem Mekong River.⁵

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.⁶

Lao wood manufacturing industries are yet to adopt contemporary processing technologies used in neighbouring countries. Research led by Dr Hilary Smith of the University of Melbourne will complete the development of new processing capability and engineered wood products from small-diameter timbers. This research benefits wood manufacturing industries in Laos by increasing capacity and growing markets for timber from new plantations, and in Australia by increasing the use of underused plantation resources. During 2022–23, reports will be completed on the characterisation of the current plantation resource and options for modelling future wood supply, as well as prospective pathways for influence and change in relevant policy, governance and administrative environments.⁷

Laos has an ambitious target of 70% forest cover by 2030, but currently nearly half of the country is degraded or unstocked forest. The Government of Laos seeks to restore native forest while providing benefits to resident and neighbouring communities. A new project addresses the opportunity to shape reforestation policy and practice, determining how to fulfil the government requirements. Professor Patrick Baker of the University of Melbourne leads this project, which will test post-disturbance treatments to accelerate and channel forest recovery towards desired economic, social, and ecological outcomes. By testing ecosystem assembly theory, the project will advance the state of the art in forest restoration.⁸

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.⁹

Fusarium wilt tropical race 4 (TR4), or Panama disease, has become widespread throughout South-East Asia. The disease is threatening smallholder banana production in Indonesia, the Philippines and, more recently, Laos. A project led by Dr Anthony Pattison of the Queensland Department of Agriculture and Fisheries aims to develop an integrated management response to the spread of the disease. The research will investigate the effects on banana production of altering the banana microbiome to suppress disease and increase plant resistance. During 2022–23, the project team will analyse completed field surveys of production systems and natural environments, and there will be ongoing development and training in statistics and experimental procedures for glasshouse and field experiments.¹⁰

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.¹¹

Laos is a comparatively small producer of pork compared with Vietnam and China, but pork production has grown significantly in recent years. Improved safety of animal source foods that is free from zoonotic parasites such as *Taenia solium*, or pork tapeworm, is gaining greater attention in the region. Dr Amanda Ash of Murdoch University leads a project to identify and recommend interventions to mitigate the risk of disease from food-borne parasites in pigs, adding value to the growing cross-border pig trade between northern Laos and Vietnam. During 2022–23, the project will implement protocols to manage food-borne parasitic disease at the farm level, such as deworming and subsequent monitoring of livestock and human health; and determine the effectiveness of engagement and communication packages for education of people in high-risk villages.¹²

Goat production in Laos has more than doubled over the past 10 years, largely driven by high demand for goat meat from Vietnam. Traditional extensive goat-raising methods can result in overgrazing of feed resources, negative consequences for the environment and higher incidence of diseases and parasites in livestock. A project led by Professor Stephen Walkden-Brown of the University of New England is aiming to enhance income-generating opportunities for goats in Lao farming systems, while identifying sustainable production practices. Additionally, the project is seeking greater understanding of consumer preferences for goats in Vietnam to further develop market specifications, especially for premium meat. During 2022–23, the project will develop performance benchmarks and define best practice for smallholders, larger goat farmers and agroforestry systems. The project will also conduct market surveys to ascertain past, current and likely future demand for goats and goat meat, and factors affecting pricing and demand.¹³

A new project will be established in Indonesia, Laos and the Philippines during 2022–23, as part of the ACIAR-IDRC Research Program on One Health. Led by the University of the Philippines (Los Banos), the project will investigate the potential to enhance livestock production systems in South-East Asia using an EcoHealth/One Health approach (page 24).¹⁴

Social Systems

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.¹⁵

The Lao Government increasingly demands evidence to support policy development. The relationship between research-for-development and policy has not been clear-cut and there is an identified need for ACIAR projects to adopt more effective research-to-policy approaches in the Lao context. Dr Hilary Smith and Professor Peter Kanowski from the Australian National University will report on their analysis case studies and in-depth interviews with key stakeholders to identify the processes, practices and circumstances that facilitate or hinder the influence and uptake of ACIAR-commissioned research within Lao policy contexts.¹⁶

Soil and Land Management

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.¹⁷

Strong market demand for concentrated livestock feeds to support livestock industries resulted in a maize boom in Vietnam and Laos and a rapid shift to annual cropping. Fluctuations in maize price, soil erosion and declining soil fertility have pressured governments and communities into looking for alternative land use options. A small research activity led by Professor Michael Bell of the University of Queensland proposes to use an established network of researchers, extension agents and traders as the basis for developing a Theory of Change focused on maize production areas in Vietnam and Laos. It will explore opportunities to link institutional research and private sector development capacity in these regions to stimulate and support the development of economically and environmentally sustainable, climate change resilient agricultural systems.¹⁸

Increasing numbers of smallholder farmers in Laos and northern Vietnam are growing maize on sloping land to meet demand for livestock feeds by poultry, pig and cattle industries in China and South-East Asia. A project led by Professor Michael Bell of the University of Queensland is helping farmers adopt maize-based farming systems that reduce soil degradation and improve smallholder livelihoods and economic viability. The project concludes in 2022 with the delivery of outreach models to support the adoption of more diversified maize-based farming systems and bioeconomic frameworks to structure the assessment of the sustainability and productivity of different crop and forage options.¹⁹

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.²⁰

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A project led by 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.

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. Assessing upstream fish migration measures at Xayaburi Dam in Laos (FIS/2017/017)
6. Building an effective forest health and biosecurity network in South-East Asia [Cambodia, Indonesia, Laos, Vietnam] (FST/2020/123)
7. Advancing enhanced wood manufacturing industries in Laos and Australia (FST/2016/151)
8. Forest restoration for economic outcomes (FST/2020/137)
9. Safe, fresh, year-round vegetables in Cambodia and Laos through research and development support of whole supply chain agribusiness networks (HORT/2021/143)
10. An integrated management response to the spread of *Fusarium* wilt of banana in South-East Asia [Indonesia, Laos, Philippines] (HORT/2018/192)
11. Rapid transformation of Lao beef sector - biosecurity, trade and smallholders [Cambodia, Laos] (LS/2021/128)
12. Investigating and developing interventions to mitigate food borne parasitic disease in production animals in Laos (LS/2014/055)
13. Goat production systems and marketing in Laos and Vietnam (LS/2017/034)
14. Livestock enhancement through EcoHealth/One Health assessment in South-East Asia (ACIAR-IRDC One Health Research Program) [Indonesia, Laos, Philippines] (LS/2022/163)
15. 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)
16. Policy impact in Laos: From research to practice (SSS/2020/142)
17. Management practices for profitable crop livestock systems for Cambodia and Laos (SMCN/2012/075)
18. Embedding knowledge and exploring future research opportunities in sloping land agricultural systems in northern Laos and northwest Vietnam (SLAM/2021/152)
19. Improving maize-based farming systems on sloping lands in Vietnam and Laos (SMCN/2014/049)
20. Water for fish and irrigation in the Mekong [Cambodia, Laos] (WAC/2021/135)