


Laos

 **A\$3.4** million
Budgeted funding

 **16**
Bilateral and regional
research projects

 **7**
Small projects and
activities

Laos is a Least Developed Country, and one of the poorest countries in South-East Asia. Approximately 23% of its population lived under the national poverty line in 2012, and poverty is almost three times higher in rural areas than urban areas. Key development challenges include limited access to high-quality education services, skills shortages and constraints to the development of the private sector. Australia's official development assistance (ODA) to Laos aims to help the Government of Lao PDR lift its people out of poverty, and develop as a prosperous and stable neighbour that can contribute constructively to the region. This objective is consistent with the themes of the Australian Foreign Policy White Paper—contributing to global efforts to reduce poverty, alleviate suffering and promote sustainable development—and building our influence through education, including scholarships.

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

Laos is a small landlocked country, but it has had substantial economic growth of more than 6% each year since 2015. The growth is driven mainly by the construction sector (due to investments in large infrastructure projects) and a resilient services sector (wholesale and retail trade growth).

Other factors that contribute to the economic growth of Laos include increased power generation, growing opportunities in the non-resource sectors from closer regional integration, and reforms to improve the business environment.

While Laos has one of the fastest economic growth rates in ASEAN, its agriculture sector has grown at a rate of only 3% over the past two decades. This is despite the fact that Laos remains primarily an agricultural economy with around 70% of the population working in the agriculture sector. Subsistence farming is still the norm and traditional production methods do not produce enough to meet market demand. Many rural families struggle to meet their own household food requirements, making malnutrition a critical issue.

According to a report by the Japan International Cooperation Agency, inefficiencies in farm production mean the agriculture sector contributed only 17% to the country's GDP in 2018. While foreign direct investment to Laos increased from A\$538 million in 2010 to A\$2.7 billion in 2017, it mostly went to infrastructure (primarily electricity generation). Agriculture attracted A\$297 million of investment, around 10% of total foreign direct investment in 2017. Based on FAO and Asian Development Bank reports, climate change and the risk of natural disasters such as floods and drought has discouraged investors.

Apart from rice, which is half of the country's agricultural output, the main traded crops in Laos include livestock, rubber, maize, coffee, bananas and citrus fruits. Lao agriculture is characterised by a relatively narrow range of productive outputs that involve small, fragmented production volumes, extremely short and seasonal market chains, and a high cost of freight. The lack of downstream enterprises is also a major barrier to growth in the sector.

In 2019, the Ministry of Agriculture and Forestry outlined plans to ensure the country is on track to meet the goals of its agriculture development strategy. The five-year development plan aims to support growth in the agriculture and forestry sector of greater than 3%, which means it will contribute 19% to the national economy. Targets include a national yield of at least five million tonnes of paddy rice, production of meat and eggs to rise to greater than 400,000 tonnes, fish and aquatic animal production to rise to 300,000 tonnes a year, and export of meat products to rise to 15,000 tonnes as production and processing operations are modernised.

A major policy development in Laos came in the form of the newly amended Forestry Law. Laos has the highest percentage of forest to land area in South-East Asia (68%). The Lao Government is committed to protecting its forest cover while making the forestry sector able to support livelihoods of its people.

The National Green Growth Strategy 2030 is the basis for actions of the Ministry of Agriculture and Forestry to increase forest cover by up to 70%. It also frames policy priorities to focus on environmental friendliness, sustainability and socially inclusive growth. The plan stresses the need to use the natural resources of Laos more efficiently, while taking a development path that is more resilient to risks such as climate change and also protects people's health. To deliver on this policy commitment, the ministry is drafting the Strategic Framework for Green and Sustainable Agriculture in Lao PDR.

Also guiding the strategic priorities of the Ministry of Agriculture and Forestry is the Lao Government's National Nutrition Strategy (2015–2025), which aims at reducing chronic malnutrition (stunting) in children under five from the current rate of 33% to 25% by 2025.

Country priorities

In 2020–21, the ACIAR Country Program for Laos plans to develop new long-term strategic program priorities based on outcomes of dialogue with the Lao Government. In the meantime, current strategic priority outcomes that guide ACIAR 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.

2020–21 research program

ACIAR supports 23 projects in Laos, 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 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. During 2020–21, the project will test and evaluate methods to slow the spread of the diseases, such as virus-free planting material and resistant varieties, and strengthen capacity and regional networks to reduce new pest and disease incursions.¹





New weed control options will enable rice farmers to adopt and benefit from mechanisation, and sustainable intensification and conservation agriculture practices. Photo: Massimo Municchi. ACIAR project: CROP/2019/145.

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, 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.²

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.³

Fisheries

Rice and fish are two essential components of nutritious diets in the Lower Mekong Basin, with fish from the Mekong River system providing the main source of animal protein. Thousands of low-level irrigation barriers have been installed in the Lower Mekong Basin to regulate water flow for rice cultivation and control flooding. These structures create barriers to fish attempting to migrate to and from floodplains, which are vital breeding and nursery habitats. Fish ladders for upstream fish passage, based on designs used in the Murray–Darling Basin in Australia, have been applied successfully in the Mekong system. To complement this work, Professor Lee Baumgartner of Charles Sturt University and teams are developing fish-friendly downstream regulators. These new designs improve fish survival as they allow fish to pass without injury.⁴

The Xayaburi Power Company, responsible for the design and construction of the Xayaburi hydroelectric dam across the Mekong River in Laos, built a complex fishway system designed to enable the upstream passage of migratory fish. It is anticipated that the design will allow over 100 species of fish to pass. The fish vary 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 company to develop robust techniques to assess the performance and effectiveness of the Xayaburi Dam fish passage facilities, and provide a standard for other hydroelectric dams planned for the mainstem Mekong River.⁵

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.⁶

Forestry

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 continues to develop new processing capability and engineered wood products from small-diameter timbers. Analyses to identify and remove policy, governance and administrative constraints to value-chain efficiencies have been highly effective, supporting investment in new processing facilities. This research is benefiting 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.⁷

Forest plantations in Laos and Vietnam are key to achieving the development aims of both countries through building human capacity, developing industry and sustaining the environment. A small research activity led by Professor Rod Keenan of the University of Melbourne extends the impact of previous project findings. The project will engage policymakers and stakeholders to contribute to the development of new laws, decrees and regulations for forest plantations, consider new policy options for forest plantations and share information on regional and national economic impacts of forest plantations.⁸

The Lao Government has set ambitious targets to restore forest cover in the country. Agroforestry will be fundamental to this process, allowing joint cultivation of trees and agricultural crops across the landscape, reducing logging pressure on residual natural forests and not adversely affecting food security. A small research activity led by Associate Professor Mark Dieters of the University of Queensland will build on achievements of previous ACIAR projects. The project will provide genetically improved planting materials of teak through clonal propagation and development of improved seed sources. Provenance stands will be established for Mai Tae Kha and Mai Du.⁹

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.¹⁰

Regional collaboration in South-East Asia is urgently needed to create a unified network to respond 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.¹¹

Horticulture

Fusarium wilt (Panama disease) has become widespread throughout South-East Asia. The disease is threatening smallholder banana production in countries including 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 to *Fusarium* wilt.¹²

Livestock Systems

Laos is a comparatively small producer of pork compared with Vietnam and China, but pork production has grown significantly in recent years, including a growing cross-border trade into Vietnam. Improved safety of animal source foods, including pork that is free from zoonotic parasites such as *Taenia solium*, is gaining greater attention in the region. A new project, led by Dr Amanda Ash of Murdoch University, aims to identify and recommend interventions to mitigate the risk of disease from food-borne parasites in pigs, adding value to cross-border pig trade between northern Laos and Vietnam.¹³

Goat production in Laos has more than doubled over the past 10 years, largely driven by high demand for goat meat from Vietnam. Expanded goat production using traditional extensive goat-raising methods has the potential to result in overgrazing of feed resources, negative consequences for the environment and higher incidence of diseases and parasites in livestock. A project led by Dr Stephen Walkden-Brown of the University of New England is developing new practices that are sustainable and productive.¹⁴

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.¹⁵

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 (NDCs) of partner countries, and if there is potential for voluntary carbon-credit trading to diversify smallholders' income.¹⁶

Social Sciences

The prevalence of food insecurity in Laos remains largely unchanged, despite strong economic growth and reductions in poverty over the past decade. The drivers of food insecurity in the northern uplands of Laos are being identified in a project, led by Dr Paulo Santos of Monash University, to provide evidence to guide the scaling up of interventions aimed at improving food security in vulnerable households. In the final year of the project, pilot interventions to improve food security will be implemented and evaluated.¹⁷

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.¹⁸

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.¹⁹

The Government of Lao PDR 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. A small research activity will examine ACIAR-commissioned research projects in relation to the processes of Lao policymaking, through analysis of case studies and in-depth interviews with key stakeholders. Through the Australian National University, Dr Hilary Smith and Dr Holly High will investigate the processes, practices and circumstances that facilitate or hinder the influence and uptake of ACIAR-commissioned research within Lao policy contexts.²⁰



Enterprise diversification is a benefit of increased mechanisation of rice farming. Photo: Massimo Mucicchi.

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.²¹

Increasing numbers of smallholder farmers in Laos and northern Vietnam are growing maize on sloping land to meet demand for livestock feeds by Chinese and South-East Asian poultry, pig and cattle industries.

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 2020, 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 different crop and forage options.²²

Water

Previous research in ACIAR-funded projects found substantial promise for groundwater development in Laos; however, further work is needed to better understand how groundwater irrigation can support agricultural development in drought-prone southern Laos. A small research activity led by Dr Paul Pavelic of the International Water Management Institute will examine the three most promising aquifer systems in the lowlands of southern Laos. The project will conduct surveys to establish groundwater development potential, a review of groundwater planning and development practices and analysis of opportunities and constraints to applying small-scale, solar-powered pumped irrigation from groundwater.²³

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See page 209 for contact details

Current and proposed projects

1. Establishing sustainable solutions to cassava diseases in mainland South-East Asia [Cambodia, Laos, Myanmar, Vietnam] (AGB/2018/172)
2. Weed management techniques for mechanised and broadcast lowland crop production systems in Cambodia and Laos (CROP/2019/145)
3. 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)
4. Quantifying biophysical and community impacts of improved fish passage in Laos and Myanmar (FIS/2014/041)
5. Assessing upstream fish migration measures at Xayaburi Dam in Laos (FIS/2017/017)
6. Translating fish passage research outcomes into policy and legislation across South-East Asia [Cambodia, Indonesia, Laos, Myanmar] (FIS/2018/153)
7. Advancing enhanced wood manufacturing industries in Laos and Australia (FST/2016/151)
8. Policy analysis for forest plantations in Laos and Vietnam (FST/2019/121)
9. Supporting agroforestry through tree improvement and gene conservation in Laos (FST/2020/119)
10. Scoping for a forest biosecurity network in South-East Asia [Cambodia, Laos, Vietnam] (FST/2020/102)
11. Building effective forest health and biosecurity networks in South-East Asia [Cambodia, Laos, Vietnam] (FST/2020/123)
12. An integrated management response to the spread of fusarium wilt of banana in South-East Asia [Laos, Philippines] (HORT/2018/192)
13. Investigating and developing interventions to mitigate food borne parasitic disease in production animals in Laos [Laos, Vietnam] (LS/2014/055)
14. Goat production systems and marketing in Laos and Vietnam (LS/2017/034)
15. Forages—taking stock and identifying research needs [Cambodia, Laos, Vietnam] (LS/2018/186)
16. 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)
17. Improving food security in the northern uplands of Laos: identifying drivers and overcoming barriers (ASEM/2012/073)
18. Developing cassava production and marketing systems to enhance smallholder livelihoods in Cambodia and Laos (ASEM/2014/053)
19. A framework for assessing agricultural extension approaches and an analysis of transferrable public health approaches [Australia, Cambodia, Laos, Myanmar, Thailand, Vietnam] (SSS/2019/186)
20. Policy impact in Laos: from research to practice (SSS/2020/142)
21. Management practices for profitable crop–livestock systems for Cambodia and Laos (SMCN/2012/075)
22. Improving maize-based farming systems on sloping lands in Vietnam and Laos (SMCN/2014/049)
23. Expanding opportunities to use groundwater for poverty alleviation and climate-change adaptation in Laos (WAC/2018/167)