

Vietnam



A\$5.02 million
Budgeted funding



18
Bilateral and regional
research projects



7
Small projects and
activities

The Vietnam agriculture sector gained an impressive annual growth rate of 2.9% in 2021, higher than the economy's overall growth of 2.6%. Vietnam has set high ambitions and a strong vision for its agricultural development, but obstacles to reaching those targets remain.

In 2021, the COVID-19 pandemic severely impacted all socio-economic aspects of Vietnam. While many sectors experienced disruptions and adverse outcomes, agricultural production continued to maintain and actively contribute to the country's stability and food security. It also contributed impressively to export revenue and proved to be one of the strongest pillars of the economy.

Vietnam has a stated ambition to become a country with world-class agriculture, prosperous rural areas, modern infrastructure, efficient use and sustainable protection of agricultural resources, and resilience to climate change. In agriculture specifically, Vietnam aims to be in the top 15 agricultural developed countries and rank tenth in agricultural processing technology by 2030. To achieve these goals, Vietnam has prioritised focusing on export commodities that meet good agricultural practices and other quality standards and by value-adding to products through new technologies.

In February 2022, Vietnam launched a national strategy for sustainable agriculture and rural development, Vietnam Issues Green Growth Strategy 2021–2030 Vision to 2050. The Strategy is an important policy document for Vietnam's economic growth and sustainable development, with specific goals related to reducing greenhouse gas emissions. The plan aims to retain forest cover at 43% and apply advanced water-saving irrigation methods to at least 60% of the total irrigated dry crop area. At COP26, Vietnam committed to a 30% reduction in methane emissions by 2030. This will translate directly into options to reduce methane emissions from rice production and livestock and opportunities for carbon storage in forestry, agroforestry and soils.

The strategy also maps out foundations for re-organising production to further develop agriculture and rural areas and increase climate change resilience in the sector. By 2050 Vietnam is expected to have a modern, efficient and environmentally friendly agriculture and developed rural areas with residents' living conditions and incomes matching those of the urban area.

One Health is an area of increasing interest involving agriculture in Vietnam. Vietnam's One Health Partnership framework for zoonoses, for the 2021–25 period, aims to minimise the risk that zoonotic pathogens and environmental agents will cross species barriers and reduce the occurrence of antimicrobial resistance in human and animal pathogens by improving multi-sectoral One Health collaboration in Vietnam.

Within that context, Vietnam sees research-for-development (especially the application of 4.0 technology) as the key to achieving its ambitions to improve efficiency and productivity and increase the competitiveness of agricultural products. Research for rural development continues to be vital, especially linking poorer rural areas to exports. The main challenges to achieving these ambitions in the coming years remain to be climate change, water shortage, soil degradation, lack of market access for agricultural produce and development gaps of ethnic minorities and women in rural areas.

Country priorities

ACIAR has sustained a program of research collaboration with Vietnam for the past 28 years. The strategy for research collaboration between Vietnam and ACIAR from 2017 to 2027 was developed on the basis of mutual acknowledgment that the relationship between ACIAR and Vietnam has evolved from donor-recipient to partnership, co-investment and, possibly, through this period, to trilateral collaboration. The strategy confirms the desire of both parties to join with the private sector wherever possible to create opportunities for poorer residents in rural and urban areas through inclusive agribusiness systems. It also focuses on transformational opportunities for women in research and agribusiness systems and on farms.

The key ambitions of the strategy are to:

- » improve the capacity of Vietnamese researchers, research managers and development partners to support sustainable and equitable farming and livelihood systems in the Mekong River Delta, Central Highlands and Northwest regions and in the fisheries and aquaculture sector
- » improve the skills, livelihoods and incomes of smallholder farmers, including ethnic minorities in the mountainous areas of the Central Highlands and Northwest regions, supported by knowledge networks that allow profitable engagement in domestic and international markets
- » improve human health and nutrition through research on integrated farming systems, nutrition-sensitive agriculture and One Health
- » improve the quality and safety of meat, fish, vegetables and fruit for domestic consumption
- » develop a deeper knowledge of markets to help prevent and reduce economic shocks for participants in agricultural supply chains
- » reduce inputs of chemicals and fertiliser for a cleaner environment, safer produce, improved soil health and more-profitable sustainable production systems
- » improve resource use efficiency to produce more food with fewer resources
- » implement practices and inform policymakers to manage climate-change impacts on agriculture.

In June 2022, Vietnam and ACIAR reaffirmed these priorities as being the key focus for our partnership. We also reaffirmed the commitment to:

- » co-fund 75% of projects during the 10-year period
- » develop research into climate change, especially drought-tolerant cropping systems in the Mekong River Delta and the Central Highlands, and saline-cropping systems for the Mekong River Delta.

2022–23 research program

- » **25 ACIAR-supported projects in Vietnam**
- » **13 projects are specific to this country**
- » **12 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 Vietnam. 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.



The strategy for research collaboration between Vietnam and ACIAR (2017–27) is based on partnership and co-investment, the intention to partner with the private sector wherever possible to create opportunities for poorer residents in rural and urban areas through inclusive agribusiness systems.

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 24).²

Smallholder farmers in South-East Asia often cannot access credit to invest in new crops or technologies, deal with risks and shocks, and safely carry wealth from harvest to planting. To help smallholders reach their production potential, a project led by Dr Alan de Brauw of the International Food Policy Research Institute aims to increase knowledge about how to design and implement innovative and inclusive agricultural value chain financing models in South-East Asia. During 2022-23, the project will analyse data to determine the impact of the project in each country and produce initial scientific reports and policy papers.³

Unmanaged expansion of coffee and pepper production in the Central Highlands region has resulted in deforestation and production on unsuitable land. Increasingly, the region is subject to the impacts of climate change, with increasing temperatures and erratic rains. There has also been misuse and overuse of mineral fertilisers, irrigation water and synthetic pesticides. A project led by Dr Estelle Bienabe of the World Agroforestry Centre aims to enhance smallholder livelihoods, including vulnerable populations, by improving the sustainability of coffee and black pepper farming systems and value chains. In 2022-23, researchers will evaluate integrated farming practices in on-farm trials to inform farming system design, initiate simple practice changes, and assess barriers to adopting recommended good farming practices.⁴

About 1.5 million smallholder farmers in the Mekong River Delta region rely on rice for their livelihood. Rice is grown on small farms, with 2 or 3 crops produced each year. The industry faces issues such as reduced returns to farmers, soil degradation, environmental pollution and declining seed purity and grain quality. In 2017, the Government of Vietnam developed a policy to encourage reduced total rice production and a focus on high quality, with the aim of exporting to premium markets. A new 4-year project, led by Dr Jaquie Mitchell of the University of Queensland, aims to establish a highly productive, sustainable, traceable and quality-assured value chain for tropical medium-grain rice in the Mekong River Delta for the benefit of rice-farming households and to meet established market requirements of the partnering global marketer. The project is a public private partnership, co-funded by ACIAR and Ricegrowers Limited, an Australian company operating a recently refurbished state-of-the-art rice mill in the Mekong Delta and global markets for higher value specialty rice products.⁵

A new project led by Dr Stephen Ives of the University of Tasmania will investigate new collaborative approaches between smallholder farming households and commercial intensive agricultural systems with a focus on beef supply chains. The project aims to establish and pilot best practice smallholder inclusive business models based on these new approaches. These new approaches and business models will be mutually beneficial, enabling improved livelihoods for smallholder farming households and improved productivity and performance for commercial supply chains in Vietnam.⁶

Previous ACIAR-funded projects helped establish a new safe vegetable industry in the Son La province of Northwest Vietnam, worth A\$70 million per year. The new value chain follows the VietGAP quality assurance protocol and supplies a range of vegetables to modern retail and traditional markets, mainly in Hanoi. However, challenges remain along the value, the most significant being traceability, compliance with VietGAP and product quality. A small research activity, led by Dr Gordon Rogers of Applied Horticultural Research, will develop and pilot low-cost digital tools (such as QR codes, temperature sensors and GPS locators) to help small and medium-sized vegetable farmers, and other value chain participants, to improve VietGAP compliance and manage the quality and safety of vegetables delivered to market.⁷



Climate Change

Australia is a world leader in greenhouse gas mitigation research in agriculture. This project assists Vietnam in strengthening its national greenhouse gas accounting systems to identify, quantify and report on rice management options that reduce emissions. Led by Professor Peter Grace of Queensland University of Technology, the project team will work with government institutions in Vietnam and will help grow capability in the data management, analyses, reporting and cross-Ministerial governance needed to support current and future emissions reduction commitments under the Paris Agreement. The team will also collaborate with a number of others who are working to support development of Vietnam's greenhouse gas inventory systems.⁸

The impact of climate change on the Mekong River Delta's coastal areas is such that current food production systems, particularly shrimp aquaculture, are already unsustainable and increasingly at risk. Mangrove poly-culture systems have the potential to provide a large-scale alternative, expanding inland as sea-level rise and extensive inundation with sea water increase. They can also contribute to carbon sequestration and support the national government's priorities for growing modern agribusinesses in the delta region. Led by Dr Pham Thu Thuy of CIFOR, in collaboration with Can Tho University and CSIRO, a new project will work alongside existing restoration efforts, building the capacity of farmers, governments and development partners to maximise the success of current mangrove-based food production and co-developing pathways for a more transformative approach linked to agri-business development.⁹

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.¹⁰

Dried sea cucumbers are highly valued in markets across China and South-East Asia. Overfishing and poor fisheries management throughout the Asia-Pacific region have resulted in serious declines of sea cucumber stocks and even led to fishery closures, reducing income-generating opportunities for coastal communities. A project led by Professor Paul Southgate of the University of the Sunshine Coast is developing culture methods that support pond-based sea cucumber farming in Vietnam and sea-based farming in the Philippines. In 2022-23 activities will include assessing potential predator mitigation measures, continuing field experiments and developing protocols for the responsible use and transfer of sandfish.¹¹



Australia's Commission for International Research and Policy Advisory Council, and ACIAR staff visited a mangrove area in Soc Trang province during their in-country annual meeting in Vietnam, June 2022, to view mangrove poly-culture systems, which are potentially a large-scale alternative to traditional shrimp aquaculture systems that are increasingly at risk to the impacts of climate change. Photo: Patrick Cape

Marine bivalves, such as mussels, clams and oysters, are known to sequester carbon in their shells. There is interest in the potential for bivalves to mitigate the effects of climate change. In northern Vietnam, a small research activity led by Dr Sarah Ugalde of the University of Tasmania examines the role of the Portuguese oyster (*Crassostrea angulata*) aquaculture industry in the carbon cycle and rates of carbon sequestration. This new information will be used to evaluate the potential value for oyster carbon farming to reduce climate-change impacts through shell recycling and value-adding, including using carbon crediting mechanisms.¹²

Hybrid grouper farming is Vietnam's most profitable marine fish aquaculture sector, involving over 400 hatchery operators and grow-out farmers. The Directorate of Fisheries aims to increase small and medium enterprises in marine aquaculture, but the hybrid grouper sector is constrained by its reliance on a nutritionally poor and variable supply of 'trash' fish. Farmers report they are willing to use more sustainable, cost-effective formulated feeds, but a lack of data on suitable feed formulations has constrained development. A project funded by DFAT and led by Dr Leo Nankervis of James Cook University will deliver nutritional data required to formulate cost-effective feeds that promote superior growth and survival and so attract smallholder farmers to switch to formulated feeds. Cooperation with large feed mills in Vietnam's private sector will support the local supply of cost-effective diets for hybrid grouper and underpin broad-scale adoption of commercial pelleted feeds.¹³



A project funded by DFAT and led by James Cook University is determining the nutritional data required to formulate cost-effective feeds for hybrid groupers to promote superior growth and survival. Photo: Khanh Long

Unique among Pacific island countries is the production of half-pearls, or mabé, in Tonga from the winged pearl oyster. Although half-pearls are generally less valuable than round pearls, an individual oyster can produce multiple half-pearls (unlike round pearls). With appropriate training, pearl production can be accomplished by community members over a 10-month culture period, compared to approximately 2 years for round pearls. Professor Paul Southgate of the University of the Sunshine Coast completes a project in 2023 that is supporting further expansion of community-based pearl farming and handicraft production in Tonga and demonstrating the feasibility of similar development in Vietnam.¹⁴

Forestry

A project with activities in Indonesia and Vietnam will underpin good plant biosecurity practices in forestry. Led by Dr Caroline Mohammed of the University of Tasmania, researchers will work with government and industry partners to extend screening approaches developed for the fungus *Ceratocystis* in acacia to eucalypts, which have replaced acacias in plantations in areas of the wet tropics. Researchers will develop remote-sensing software applications for cheap and rapid forest health surveillance and, through geospatial modelling, deliver risk maps under current and future climates at a regional level for the highest-priority pests and pathogens. In 2022–23 activities will include building the capacity of local partners to access climate data and run distribution models, and identifying eucalypt parents for hybridisation.¹⁵

Northwest Vietnam is among Vietnam's poorest regions. It is mountainous, deforested and severely eroded. A project led by Associate Professor Doland Nichols of Southern Cross University will increase tree cover in Muong La District by developing a farmers' cooperative nursery producing and selling fruit and timber trees and subsidising members' tree planting. A linked silvics experiment in Muong La Nature Reserve will use farmer-produced seedlings to provide knowledge responsive to the Vietnamese Government's directive to develop climate-resilient, native timber production for its processing industries. Both activities will provide research training for Tay Bac University faculty and students and contribute to post-flood local restoration.¹⁶

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.¹⁷

Livestock Systems

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 Tadelles 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.¹⁸

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.¹⁹

Market demand for beef is increasing rapidly in Vietnam, outstripping current levels of domestic production. A project led by Dr Stephen Ives of the University of Tasmania is investigating and implementing whole-farm solutions for smallholder cattle producers in the highlands of Northwest Vietnam. This will help smallholder farmers shift from extensive to more-intensive production systems so they can meet market specifications, increase market linkages and improve profitability. In 2022, project will complete capacity building activities for stakeholders in the beef value chain, including key advisory and extension staff, and design an up-scaling strategy for a sustainable crop-livestock system.²⁰

A review of key thematic areas of animal health governance considered regulation, the veterinary workforce, ethics and welfare, surveillance, innovation, biosecurity, trans-boundary trade and service delivery. The review found that significant gaps existed in knowledge and engagement, especially when compared to the human health sector. Dr Kevin Bardosh leads a project to address recommendations from the review to strengthen and support the animal health sector in low and middle-income countries. The recommendations include establishing and convening a network of social and political scientists working on animal health governance; and conducting a systematic review of the social and political science literature in the global animal health field.²¹



A project led by the University of Tasmania is investigating and implementing whole-farm solutions for smallholder cattle producers in the highlands of Northwest Vietnam to shift from extensive to more-intensive production systems, to meet rapidly growing market demand and specifications, increase market linkages and improve profitability. Photo: Vu Khanh Long

Social Systems

A small research activity will report on its analysis of gender transformative tools designed to support ethnic minorities in the Technologically Enhanced Agricultural Livelihoods (2018-2022) project operated by CARE International in the northern uplands of Vietnam. The project, led by Dr Rochelle Spencer of Murdoch University, determined how the tools contribute to changing gender relations and empowering women, and to what extent. The project will complete training of in-country partners and 10 early-career social science researchers in mixed-method research, including participatory methods and project-level Women's Empowerment in Agriculture Index.²²

Soil and Land Management

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.²³

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.²⁴

Sea-level rise and changes to seasonal rainfall patterns due to climate change result in decreased freshwater availability and higher saline intrusion of the Mekong River Delta during the dry season. To maintain productivity and profitability, farmers require better soil-management techniques and profitable alternative crops to grow in the dry season. A project led by Dr Jason Condon of Charles Sturt University is providing evidence-based options for profitable crop diversification in the rice production areas of the Mekong River Delta. The project aims to increase production and profitability through diversification of saline-affected rice-based cropping systems and create a capacity legacy to enable these systems to adapt to ongoing climate change.²⁵



ACIAR Research Program Manager, Soil and Land Management, Dr James Quilty (right), inspects salinity affected soil in the Mekong Delta region of Vietnam with local soil experts Quach Kim Hoa (left) from the Soc Trang Provincial Department for Agriculture and Rural Development, and Dr Chau Minh Khoi (middle) the ACIAR Country Coordinator from Can Tho University. Photo: Patrick Cape

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See page 186 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. Food loss in the *Pangasius* catfish value chain of the Mekong River Basin (Food Loss Program) [Cambodia, Laos, Vietnam] (CS/2020/209)
3. Inclusive agriculture value chain financing [Indonesia, Myanmar, Vietnam] (AGB/2016/163)
4. Increasing the sustainability, productivity and economic value of coffee and black pepper farming systems and value chains in the Central Highlands region of Vietnam (AGB/2018/175)
5. Planning and establishing a sustainable (SRP) smallholder rice chain in the Mekong Delta [Vietnam] (AGB/2019/153)
6. Integrating smallholder households and farm production systems into commercial beef supply chains in Vietnam (AGB/2020/189)
7. Piloting digital monitoring of VietGAP compliance and quality in Vietnam vegetable value chains (AGB/2021/153)
8. Supporting greenhouse gas inventories and targeted rice mitigation options for Vietnam (CLIM/2019/150)
9. Preparing for mangrove-based climate and agribusiness transformation in the Mekong Delta [Vietnam] (CLIM/2021/138)
10. FishTech: Integrating technical fisheries solutions into river development programs across South-East Asia [Cambodia, Indonesia, Laos, Vietnam, Thailand] (FIS/2018/153)
11. Increasing technical skills supporting community-based sea cucumber production in Vietnam and the Philippines (FIS/2016/122)
12. Blue economy: Valuing the carbon sequestration potential in oyster aquaculture [Vietnam] (FIS/2020/175)
13. Supporting grouper farming smallholders in Vietnam to improve their SME businesses by engaging with aquafeed companies to produce commercial feeds [Vietnam] (FIS/2021/121)
14. Half-pearl industry development in Tonga and Vietnam (FIS/2016/126)
15. Managing risk in South-East Asian forest biosecurity [Indonesia, Vietnam] (FST/2018/179)
16. Vietnamese native tree species for improved livelihoods [Vietnam] (FST/2020/134)
17. Building an effective forest health and biosecurity network in South-East Asia [Cambodia, Indonesia, Laos, Vietnam] (FST/2020/123)
18. 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)
19. Goat production systems and marketing in Laos and Vietnam (LS/2017/034)
20. Intensification of beef cattle production in upland cropping systems in Northwest Vietnam (LPS/2015/037)
21. Global animal health governance: High-level consortium [Vietnam] (LS/2021/157)
22. Analysing gender transformative approaches to agricultural development with ethnic minority communities in Vietnam (SSS/2018/139)
23. Embedding knowledge and exploring future research opportunities in sloping land agricultural systems in northern Laos and northwest Vietnam (SLAM/2021/152)
24. Improving maize-based farming systems on sloping lands in Vietnam and Laos (SMCN/2014/049)
25. Farmer options for crops under saline conditions (FOCUS) in the Mekong River Delta, Vietnam (SLAM/2018/144)

