

Key statistics

GDP per capita (US\$)^a	858
Population (million)^a	6.4
Funding	\$m
2009–10 actual	2.74
2010–11 budget allocation	3.73
2011–12 budget estimate	4.96

^a data from 2009 & 2010 <<http://unstats.un.org/unsd/demographic/products/socind/>>

Dr Bounthong Bouahom (NAFRI) and Dr John Lacy (NSW Industry & Investment) discussing the growth of irrigated rice through experiments conducted in a research partnership between Laos and Australia

MEDIUM-TERM STRATEGY

The focus of future Australian assistance, as outlined in the Australia–Lao Development Cooperation Strategy 2009–15, is through three pillars: education, inclusive growth through trade and investment, and rural development. ACIAR’s program is directly aligned with the rural development initiative. Approximately 80% of poor people in Laos live in rural areas. Agriculture forms 53% of GDP but at least one-third of the population remain below the poverty line.

Food security is still central to agricultural development in Lao, which is one of four countries involved in a new initiative on safeguarding food security in rice-based farming systems. ACIAR research aims to increase the productivity of these systems, together with fostering cooperation with CGIAR centres to fast-track development of new crop varieties with advanced informatics and biotechnology. Some enabling research on underpinning institutional and policy arrangements affecting rice-based farming systems will also be commissioned. These themes will be complemented by capacity building and training.

ACIAR’s program supports research that underpins the Lao PDR Government’s objectives of:

- identifying and implementing alternatives to shifting cultivation in upland regions, with ACIAR support through fostering of technical interventions to improve the profitability of low-input household farming systems as an alternative to shifting cultivation
- improving the productivity of lowland farming systems, and maintaining and increasing critically important rice yields to improve food security and incomes, with ACIAR support through applied research that aims to

improve productivity and diversification of rice-based farming systems, livestock and fisheries

- reducing the vulnerability of rainfed cropping agriculture to climate variability and change, with ACIAR support through research on more-efficient use of soil and water resources at the farm level, complementing basin-wide programs on water and climate change supported by AusAID and other donors.

At the request of the Lao PDR Government, there will be increased emphasis in southern Laos. There is a need for research to improve food security from rice-based and other southern Laos farming systems in both lowland and upland districts, along with technical and agribusiness research collaboration to understand and develop domestic and export market opportunities for rice, cattle and other agricultural products.

Where appropriate, research interventions are tailored to complement larger donor programs. Over the next few years ACIAR will partner with programs of the International Fund for Agricultural Development, the Asian Development Bank (through the Sustainable Natural Resources Management and Productivity Enhancement Project) and the World Bank to underpin biophysical, socioeconomic and agribusiness development of rice-based and other farming systems in southern Laos. This will enable ACIAR to work with these development partners to use research output to support capacity building at the village level, produce and disseminate extension materials, and develop learning alliances with communities and NGOs. Collaboration with these partners will involve working closely with line ministries and other donors to ensure compatibility with the principles of the Vientiane Declaration.

Priorities for collaborative research on food security from rice-based farming systems in the southern provinces were discussed in August 2009 at a consultation workshop in Vientiane. ACIAR will continue to encourage linkages with other donor-funded programs, and will aim to extend the positive impact of previous ACIAR-funded projects in the region.

Priorities for the medium term are:

- Market-driven alternatives to shifting cultivation in upland regions:
(*focus on northern provinces—Huaphan, Bokeo, Luang Nam Tha, Xieng Khouang, Luang Prabang*)
 - » Enhancement of the impact of earlier ACIAR project investments in livestock production and health at the farmer level
 - » Establishment of sustainable smallholder teak-based agroforestry systems, including through better silvicultural management of timber and non-timber forest species and value-adding
- Improved food security and profitability of farming systems through diversification: (*focus on Savannakhet and Champasack provinces, activities in Attapeu and Vientiane provinces*)

Rice and other field crops:

- » Research to support the spread of intensive rice production practices that require less labour
- » Mapping of recommended rice variety domains, combining agroecological suitability analysis and farmer participatory assessment
- » Land-use suitability mapping of potential areas for crop and livestock diversification
- » Implementation of soil fertility management practices, including better matching of nutrients (and micronutrients) to soil series and use of green manures

Horticulture:

- » Development and dissemination of crop-specific technology information packages, and research into alternative extension and information delivery models for traders and producers
- » Implementation of low-cost vegetable postharvest handling and other logistical and market-oriented technologies
- » Plant biosecurity, including biosecurity- and quarantine-related R&D, molecular identification of quarantine pests and technical capacity building

Agricultural water resource management:

- » Assessment of the economic and social acceptability of supplementary irrigation to reduce risk in the production of rainfed rice and other crops
- » Optimisation of field water application for irrigated crops
- » Use of systems for improving non-rice cropping management (scheduling, crop choice, rotations, soil suitability)
- » Assessment of spatial and temporal availability, quality and sustainability of surface water and groundwater resources, and options for multi-use on-farm water storage

Livestock and fisheries:

- » Assessment of options for diversification of incomes and income improvement through livestock production within rice-based farming systems
- » Assessment of options for the intensification of cattle production
- » Increasing production from smallholder riverine fisheries and pond aquaculture
- » Assessment of design of fish-passage structures to enable movement of fish between rivers and flood plains
- » Analysis of incentives for vaccine use, and the capacity for delivery of high-quality, available vaccines for CSF and other diseases of cattle, pigs and poultry
- » Improvements to the policy and regulatory environment for regional disease control

Agribusiness, marketing, policy and social issues:

- » Determination of institutional conditions that foster farmer cooperatives and private-sector involvement in the marketing of Lao rice, and integration of improved postharvest technologies along the rice value chain
- » Establishment of household typologies to determine sociological factors affecting uptake of new technologies and opportunities for diversification
- » Determination of impacts of regional trade environments on household livelihood strategies
- » Analysis of value chains for rice, cattle and selected crops to better align technical research with market needs

- » Analysis of rice self-sufficiency, internal seasonal self-sufficiency policies, price stabilisation, and domestic and export trading policies—at national and provincial levels

Adapting Lao farming systems to climate change:

- » Location-specific recommendations for development of more-resilient cropping systems, including assessment of new (e.g. early maturing or drought tolerant) crops
- » Utilisation of farming systems analysis and farm financial modelling to develop options for adaptation relevant to farmer decision-making
- » Better use of residual moisture, late-season rainfall or limited supplementary irrigation to produce an additional crop.

2011–12 RESEARCH PRIORITIES AND PROJECTS

Market-driven alternatives to shifting cultivation in upland regions

Improving health and production of village pigs, cattle and fishing operations

Losses from diseases of livestock have a major impact on villager income in upland Laos. Rapidly spreading viral diseases are important, given the position of Laos as a major livestock transit route. A cluster of projects is assessing the risks of livestock movement in transferring disease, improving the diagnosis and management of rapidly spreading viral diseases such as FMD and CSF, improving access to animal vaccines, and understanding the impacts on human health. Improved production systems are being developed to increase income by improving survival and growth rates in pigs and cattle, including studies on the assessment of approaches to adoption of new technologies. Policy, diagnosis and vaccine issues are necessarily addressed centrally (in Vientiane), while the focus for fieldwork is in the northern provinces.

AH/2006/025 Understanding livestock movement and the risk of spread of trans-boundary animal diseases

Livestock movement increases the risk of trans-boundary disease, but patterns of movement in the Mekong countries are poorly understood. This project focuses on livestock movement in and out of Laos and Cambodia, developing new methods to predict and track movement, including the use of livestock networks to acquire information and test disease control interventions.

AH/2006/159 Best practice health and husbandry of cattle and buffalo in Lao PDR

Cattle and buffalo are important to livelihoods of all rural communities in northern Laos and offer potential as income-generating enterprises, accessing national and international markets. This project investigates village-based approaches to biosecurity threats to these opportunities in Luang Prabang and Xieng Khouang provinces.

AH/2009/001 (proposed, multilateral, CIAT) Increased productivity and reduced risk in pig-production market chains for improved livelihoods in Lao PDR. Component 1: animal and human health

AH/2009/018 Improved livelihoods through developing pig-based enterprises in upland Lao PDR. Component 2: marketing and production

This project builds on earlier outputs of projects on feeding pigs using legumes, the major diseases of FMD and CSF, and investigation of the disease threats to humans of diseases associated with pig production—to develop the ‘One Health’ approach linking the public and animal health institutions.

AH/2010/019 (multilateral, CIAT) Increased productivity and reduced risk in pig-production market chains. Component 2: animal production

Pigs are an integral part of farming systems in rural Laos, especially for poor people. Pigs are often one of the few cash-generating opportunities. In conjunction with the sister project AH/2009/001, the project aims to improve pig productivity by increasing output per sow, piglet survival and growth performance.

AH/2010/045 Sustainable assessment of livestock movement and disease risk in the Mekong region

Regional movement of livestock is associated with disease transmission, especially FMD in cattle and pigs and CSF in pigs. This project will develop improved methods to assess disease risk and strategies for disease control in the six countries of the AusAID-supported SEACFMD program: Laos, Cambodia, Vietnam, China, Thailand and Myanmar.

Incomes from forestry and agroforestry

Laos plans to increase its forest coverage from less than 52% now to 70% by 2020, to safeguard the country's water resources and enhance rural livelihoods. The government is encouraging the planting of high-value trees such as teak and eucalypts, both to increase forest cover and improve rural incomes, of which about 40% currently comes from forest products. ACIAR's Laos forestry projects explore the use of teak-based agroforestry systems and other means of enhancing livelihoods associated with forests and forest

industries. Priorities include enhancing agroforestry systems, improving timber processing and marketing, and developing payments for environmental services from sustainably managed smallholder plantations.

FST/2004/057 Enhancing on-farm incomes through improved silvicultural management of teak and paper mulberry plantations in Luang Prabang province of Lao PDR

This project aims to improve the management of smallholder teak plantations and agroforestry systems in Luang Prabang province in northern Laos. In its final year the project will focus much of its remaining work on defining profitable agroforestry systems involving teak and finalising village-based systems for distributing teak germplasm.

FST/2010/012 (proposed) Sustainable plantation forest industries for Laos

This new project is currently being scoped, but is expected to focus on emerging research questions related to enhancing plantation-based value-added forest industries and the contribution of environmental service payments from smallholder plantations.

FST/2011/003 (proposed) Systems for facilitating payments for environmental services in Laos

This new project is currently being scoped, but is expected to focus on emerging research questions related to measuring environmental services, such as carbon sequestration, water quality and biodiversity conservation, from a range of agricultural and forest land-use systems, and exploring the development of efficient and equitable systems for distribution of payments for environmental services.

Improved food security and profitability of farming systems through diversification

Rice-based lowland cropping systems

The study on rice-based farming systems builds on 15 years of work supported by ACIAR and Lao-IRRI on varietal introduction, assessment and management for upland and lowland environments. The main project is designed to improve the productivity and profitability of the lowland rice-based systems, and to pursue diversification in suitable locations by adding non-rice crops under irrigation in the dry season. The main strategies include intensifying rice production systems by increasing the number of crops grown on the same land each year following the main rice crop, and introducing potentially more-profitable crops such as maize, soybean and other grain legumes where there is access to irrigation. Many rice-based systems are intricately linked to livestock production, and hence targeted work on improvement of livestock production will maximise overall

farming system productivity. Policy research relevant to rice production and trade is also needed to underpin institutional arrangements for food security.

ASEM/2009/023 (proposed) Agricultural policies for rice-based farming systems in Laos and Cambodia

The key objective is to analyse current agricultural strategies, policy processes and policy settings in Laos and Cambodia, in the context of regional, social, economic and environmental trends, in order to identify improved policy options and development processes.

ASEM/2011/009 (proposed) Scaling out provincial extension in southern Lao PDR

The project will build on the rice systems work in southern Laos and the livestock extension systems in northern Laos, focused at the smallholder level, to identify and implement interventions to enhance extension services at the provincial level. Three southern provinces will be the project focus.

CSE/2006/041 Increased productivity and profitability of rice-based lowland cropping systems in Lao PDR

Direct seeding technology for dry-season irrigated lowland rice is being tested, alongside farmer participatory variety selection focused on wet-season rainfed lowland rice in the centre and the south. For non-rice crops, agronomic practices for maize, soybean and mung bean for dry-season after wet-season rice are being developed.

CSE/2009/004 Developing improved farming and marketing systems in rainfed regions of southern Lao PDR (Mekong–South Asia Food Security Research Program: component 1)

The project integrates aspects of crop management, water management, forages and livestock, and marketing to tackle low productivity and extensive poverty in the five southern provinces. Research will be centred around hubs identified along transects running from the Mekong lowlands to the uplands, and results will be scaled out through projects in the area supported by IFAD–Asian Development Bank and the World Bank.

SMCN/2010/084 (proposed) Upgrading the analytical laboratory at the National Agriculture and Forestry Research Institute (NAFRI)

The project will aim to upgrade facilities for soil and plant tissue chemical analysis at NAFRI, the principal government organisation in Laos for integrated agriculture, forestry and fisheries research.



Phommavong Thavone of the Living Aquatic Resources Research Center in Laos throwing a net to catch migrating catfish. Photographer: Lee Baumgartner

SMCN/2010/085 (proposed) Profitable crop–livestock systems for Thailand, Cambodia and Laos

The overall aim of this project is to examine the potential of alternative technologies to alleviate some of the current production constraints to increasing the profitability of rice-based farming and cattle production systems in rainfed lowland environments. The project will identify integrated management practices best suited to the local agroecological and socioeconomic conditions.

Horticulture

Current work in horticulture aims to develop technical and R&D capacity in biosecurity, plant quarantine, and pest and disease diagnosis as part of a regional Mekong initiative to develop a core of skills and a technical network within government and associated agencies in Thailand, Laos and Cambodia.

HORT/2010/069 (proposed) Developing plant biosecurity research and technical capability in the Mekong countries

This project aims to develop biosecurity R&D and technical diagnostic skills in Thailand, Laos and Cambodia to underpin development of potential international market opportunities for Mekong horticultural products. The project will build on previous work carried out in Thailand to develop a 'centre of

excellence' that can act as a capacity-building and technical resource for other Mekong countries. In the first year it will concentrate on capacity building and network development.

Improving riverine and culture fisheries productivity

Fish, predominantly from riverine and reservoir capture fisheries, is the main animal protein source of the Lao people. A recently completed cluster of projects developed technological packages that can, with village community participation, optimise yields from culture-based fisheries practices in floodplain depressions and reservoir coves, and contribute to the sustainable management of riverine fisheries in Laos. A major focus of current work is to develop fish-passage technology and capability to allow movement of fish past low-level barriers such as weirs and flood-control structures.

ASEM/2009/055 (proposed) Significance of fisheries for smallholder livelihoods in Lao PDR

Flood mitigation and climate change are influencing water flow, which may affect lowland fisheries. The project will define mitigation strategies for adaptation to the altered environment.

FIS/2009/041 Development of fish-passage technology to increase fisheries production on flood plains in the Lower Mekong Basin

The overall goal of this research activity is to facilitate the large-scale rehabilitation of floodplain fish resources in both Australia and the Lower Mekong Basin. This will be achieved through the construction of fishways on floodplain regulators in both the Murray–Darling and Lower Mekong basins.

FIS/2010/058 (proposed) Assessing the values of fish for rural households in the Mekong Basin

The aim is to quantify the multiple values of fish resources and convey information to national decision-makers and development agencies for sustainable and improved rural livelihoods.

FIS/2011/013 (proposed) Enhancement of culture-based fisheries in Lao PDR

The objective is to consolidate the benefits gained from the adoption of culture-based practices through community group organisations, and to ensure the appropriate application of broodstock management plans for indigenous species.

Lao Agricultural Research Fund (LARF)

ASEM/2006/060 Lao Agricultural Research Fund (LARF)

LARF provides support for a wide range of small research projects, as well as enabling Lao scientists to gain experience in the design and management of agricultural research projects.

Adapting Lao farming systems to climate change

Climate change is already having a negative impact throughout Asia, with evidence of increasing temperatures and projections of an increase in monsoonal rainfall in some countries. In Laos the most significant threats related to climate change are considered to be flooding at the end of the growing season before the rice harvest and mid-season drought spells after planting.

A 5-year collaborative research program addressing climate change, including in Lao PDR, was initiated in 2009. The emphasis is on adaptation to climate change based on water management in lowland rice-based cropping systems of two districts in Savannakhet province.

LWR/2008/019 Building capacity of farming communities in Cambodia, Laos, Bangladesh and India to adapt to climate change

The project is building capacity of farming households in two districts of Savannakhet to enable them to adapt their rice-

based cropping systems to accommodate climate variability and change. It will also develop strategies to enable policymakers to deliver more-effective climate adaptation.

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KEY PERFORMANCE INDICATORS (2011–12)

- Fish passage technology implemented in the Lower Mekong Basin
- New project commenced on agricultural policy, with special emphasis on rice
- New plantation forestry value-chain project commenced, integrating log supply and processing research with exploration of payments for environmental services across different land use
- Analysis of provincial-level extension systems completed and documented
- Trans-disciplinary research program implemented for rice-based farming systems in southern provinces
- Cost analysis of risks to human health in pig production systems completed
- Integrated program for ACIAR-supported livestock health and production research planned and documented
- A regional program created for a partnership with OIE, SEACFMD and participating countries to assess and control livestock biosecurity risks
- LARF projects moved from being largely 'training-oriented' to become more outcomes focused