



Australian Government

Australian Centre for  
International Agricultural Research

Soil and Land Management

# Integrating soil and water management in vegetable production in Lao PDR and Cambodia



## Overview

Lao PDR and Cambodia are developing economies seeking to improve crop yields for domestic consumption and export markets. Enhancing these areas would align with their policy emphases on improving food security, overcoming rural poverty and enhancing economic development.

Women play a key role in socio-economic development, and in both countries female farmers outnumber men. Equity and opportunity for women in agriculture is therefore critical to economic development.

Increasing vegetable production would improve nutrition, generate incomes, and enhance access to learning and education, as well as the management capacities of farmers. But poor soils, and water constraints, limit vegetable productivity in both countries.

Low fertility associated with acid conditions and poor structure are characteristic of Acrisols, the dominant vegetable-growing soils of Lao PDR and Cambodia. Upland soils (e.g. Ferrosols of the Bolaven Plateau in Lao PDR) are of better initial fertility but are subject to nutrient imbalance and decline. Irrigation is necessary for vegetable production during the dry season, however, the efficiency of irrigation is very low due to suboptimal use of technology and a lack of understanding of the relationships between soil water status, crop development and crop water needs.

## KEY FACTS

**ACIAR Project No.** SMCN/2014/088

**Duration:** May 2016 to June 2020 (4 years)

**Target areas:** Lao PDR and Cambodia

**Budget:** A\$1,600,599

### Project Leader

Dr Alice Melland, University of Southern Queensland

### Key partners

- University of Tasmania
- National Agricultural and Forestry Research Institute, Lao PDR
- Cambodian Agricultural Research and Development Institute, Lao PDR
- Horticultural Research Institute, Lao PDR
- National University of Laos
- Clean Agriculture Development Centre
- University of Queensland

### ACIAR Research Program Manager

Dr James Quilty

## Objective

**The project's overall aim is to improve soil and irrigation water management to achieve sustainably improved vegetable yields and household economies.**

**The project's specific objectives are to:**

- Analyse input supply chains and identify opportunities to improve their functioning and performance to deliver inputs to farmers in a timely and efficient manner.
- Analyse the socio-economic and socio-cultural factors relevant to the adoption of improved soil and water management strategies and to design and implement strategies to improve adoption and associated household well-being.
- Develop technically sound and economically viable practices for management of structurally unstable and nutrient-deficient alluvial soils (Acrisols) and i[land soils (Ferrosols).
- Develop improved management of irrigation in relation to soil-water status and crop requirements in various growth stages to improve crop yield and profitability.

## Expected scientific results

- New knowledge on input supply chains and improved soil and water management for sustainable vegetable production.
- Understanding of the functioning of agricultural systems, particularly the impact of improved soil and water management on vegetable production and sustainability.
- Strategies for enhanced adoption of improved practices based on an enhanced understanding of input-side value chains and socio-cultural factors influencing adoption, facilitating vegetable development of more appropriate extension and support practices and leading to use of more resources for production.
- Greater understanding of resource (climate, soil and water) constraints and development of practices for their management in the context of vegetable production in a highly seasonal rainfall environment.

## Expected outcomes

- Greater capacity among researchers, extension staff and educators in Laos and Cambodia on improved land management and irrigation practices, socio-economic studies and supply chain assessment.
- Changes in thinking and attitudes on input applications and management of soil fertility and irrigation, contributing to changes in practice and the longer-term development of sustainable vegetable production.
- Improved economic performance of farms following adoption of improved soil and water management, and opportunities for substantial increases in yield and quality improvement.
- Enhanced urban/regional equity through improved farm production and availability of vegetables for sale.
- Greater ability of agricultural producers to enter the commercial business sector.
- Contributions to food security and resource conservation in the emerging market economies of both countries.
- Improvements in vegetable production indirectly contributing to enhanced nutrition and incomes of participating households.

