



Soil and Land Management

Land suitability assessment and site- specific soil management for Cambodian uplands

Overview

In Cambodia, more than one quarter of the country's 3 million ha of uplands is used by smallholder farmers, providing food security and livelihoods. High agricultural prices have driven agricultural growth and farmland expansion in recent decades.

The Royal Government of Cambodia has recognised that expanding cultivation into unused or degraded land is not environmentally sustainable. The government has prioritised intensification, improved yields and diversification of cropping in areas where upland farming is under development.

In these rainfed uplands, crop yields and profits are vulnerable to low soil fertility, drought conditions and fluctuating markets.

These constraints vary among landscape and soil types. Hence, cost-effective, site-specific soil and land management technologies need to be developed to promote sustainable and profitable farm businesses in the uplands and to minimise the risk of production losses and soil degradation.

Characterising and mapping constraints and determining land suitability is a critical enabling technology for improved field crop production in upland areas.



KEY FACTS

ACIAR Project No. SMCN/2016/237

Duration: October 2017 to September 2021 (4 years)

Target areas: Cambodia

Budget: A\$2.3 million

Project Leader

Dr Wendy Vance, Murdoch University

Key partners

- Cambodian Agriculture Research and Development Institute
- Department of Primary Industries and Regional Development
- Royal University of Agriculture

ACIAR Research Program Manager

Dr James Quilty

Objective

The project aims to improve soil management in selected upland farming systems of southwest and southeast Cambodia to increase yields and returns for diverse crop options.

The project's specific objectives are to:

- Introduce methodologies for soil and land suitability assessment and identify main soil types and landscape patterns in representative upland regions.
- Characterise the soil and land constraints to crop production and identify soil management technologies for these regions.
- Provide tools and information that enable stakeholders to identify the main soil types and their constraints to crop production.
- Expand the knowledge base of soil resources and capability for soil resource management in Cambodia.

Expected scientific results

- Development and testing of tools that enable people to identify the main upland soils, their key constraints and appropriate management techniques.
- Introduction of rapid soil assessment methods, including documentation and capacity building in use of the methodologies.
- Spatial analysis of soil data to identify the extent of the key upland soils, and potential new soil types to be added to the Cambodian Agronomic Soils Classification (CASC).
- Pedological assessment in study areas to identify soil types classified to the Food and Agriculture Organisation of the United Nations (FAO) World Reference Base for Soil Resources (WRB) and the CASC.
- Reports on soil constraints to crop production, including physical constraints and nutrient deficiency through diagnostic trials.
- Assessment of on-farm crop management techniques that overcome soil constraints to crop production.

Expected outcomes

- Farmers in study areas recognise soil types and constraints to crop production on their farms and adopt suitable management strategies to overcome these constraints.
- Extension practitioners use knowledge and tools developed by the project to promote and assist farmers to implement improved soil management practices.
- Project partners use land suitability assessment and site-specific land management practices in their ongoing programmes.
- Project partners use newly acquired expertise to continue assessment of soil and landscape resources across upland regions of Cambodia.
- The expanded soil and landscape database and CASC used by stakeholders to improve intensification and diversification of crop production in upland regions.
- Increased capacity (including knowledge, expertise, resources and tools) of smallholder farmers, extension practitioners, researchers and policy-makers to identify and manage upland soils, facilitating better decision-making regarding crop selection and site specific land management practices.

