



Soil and Land Management

Improving maize-based farming systems on sloping lands in Vietnam and Lao PDR

Overview

Maize cultivation is rapidly expanding in the northern uplands of Vietnam and Laos.

This increasing demand for concentrate livestock feeds is supported by an expanding poultry, pig and cattle industries in China and South-East Asia.

This expansion is driving the transition of upland rice and maize production and cultivation onto sloping lands, including forest land.

Smallholder maize cultivation on sloping land is characterised by high rates of run-off, soil erosion and nutrient loss that quickly lead to declining soil fertility and maize yields. Many areas become completely unproductive in less than 10 years. The impact is further compounded by ethnic minorities in mountainous regions changing from semi-nomadic living and swidden agricultural production to more sedentary habitation requiring long-term use of the land.

Previous projects have developed a range of options to move from poorly managed maize monocultures to more sustainable diverse farming systems. These promising technical results have demonstrated that diversification from maize monoculture is desirable. But adoption farmers must see this diversification as an income earning opportunity, and not simply as an erosion mitigation practice.



KEY FACTS

ACIAR Project No. SMCN/2014/049

Duration: February 2017 to December 2020 (4 years)

Target areas: Vietnam and Lao PDR

Budget: A\$1,997,363

Project Leader

Professor Michael Bell, The University of Queensland

Key partners

- Conservation Agriculture Network, Southeast Asia (CANSEA)
- Vietnam's Ministry of Agriculture and Rural Development
- Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI)
- Soil and Fertilizer Research Institute
- Tay Bac University
- International Centre for Tropical Agriculture (CIAT)
- CIRAD
- National University of Laos

ACIAR Research Program Manager

Dr James Quilty

Objective

The project's overall aim is to promote the adoption of improved and diversified maize-based farming systems that reduce soil degradation and improve smallholder livelihoods and economic viability on sloping lands in the northern mountains of Vietnam and Laos.

The project's specific objectives are to:

- Evaluate the development of value chains for maize and complementary crops, forages and livestock to support more diverse and sustainable maize-based farming systems.
- Integrate complementary crops or forages/livestock into more diverse farming systems that can maintain profitability with lower levels of erosion and loss of soil fertility.
- Develop outreach models and advice for local government policy to support the adoption of more diversified maize-based farming systems on the sloping lands of Vietnam and Laos.

Expected scientific results

- Development of effective crop husbandry techniques (sowing dates, plant arrangements and fertiliser strategies) to maximize returns and minimize production and environmental risks from the adoption of more diverse cropping systems based on combinations of intercropping and relay cropping options.
- Guidelines to improve legume husbandry, provide conservative estimates of residual N benefits for subsequent maize crops (based on legume growth and end use) and strategies to modify fertilizer management in the cropping system to aid adaptation and adoption to increase the sustainability of outcomes.
- Development of bio-economic frameworks to structure the assessment of different crop and forage options for inclusion in farming systems on sloping lands.
- Through a participatory approach, development of a broad variety of outreach models such as farmer-to-farmer learning, coordinated and facilitated by government extension services, to achieve lasting practice change in cropping systems on sloping lands.

- Development of methodologies to model impacts, effectiveness and sustainability of outreach models, and identification of key success factors for broader implementation of land use change programmes in target countries, and potentially across the Greater Mekong region.

Expected outcomes

- Identification, adaptation and adoption of diversified and more sustainable farming systems that can maintain or improve profitability.
- Greater capacity developed across the two countries in three key domains:

Capacity of researchers in various fields, including agronomy, value chains and market linkages, practice change, systems thinking and approaches, English language, improved research methodologies and team work.

Capacity of stakeholders in the private and public sector, including staff of DARDs and PAFOs, government extension personnel and private sector value chain actors, to become agents of change.

Capacity of researchers in both Vietnam and Laos to share information regionally and participate in cross-border studies.

