

Soils Management and Crop Nutrition Research Program Strategy

Global context/trends

Limited availability of arable land, increasing population growth and competition from urban and industrial uses are forcing more smallholder farmers to farm marginal lands. Over-exploitation of vegetation and soil resources, together with inappropriate farming systems, are resulting in land degradation, including soil erosion, nutrient depletion and accelerated soil acidification, salinisation and desertification. Rising population, particularly in the developed world, necessitates increased food production. Ensuring that agricultural production is sustainable—and benefits smallholder farmers—is a key challenge for long-term food security.

International 'fit'

Feeding a growing global population will require boosting production at large- and particularly small-scale farming enterprises. For smallholder farming, increased productivity offers both enhanced food security and the opportunities that come from selling surpluses of staple and high-value crops. The main staple foods are crops—cereals, horticulture and root crops. Achieving food security entails boosting productivity of soils within the complex interactions with water resources, socio-economic conditions, policy settings and sustainable systems.

Research themes

Research themes	Priority research areas
Farming practices:	Integrated crop–livestock farming systems for cost-effective production systems, with greater focus on achievement of community impacts.
Agronomic management:	Agronomic packages that increase crop productivity by optimising resource inputs.
Nutrient management:	Efficient use of crop residues and animal waste for improved nutrient cycling and minimising nutrient mining.
Systems diversification:	Diversification and intensification options, including crop rotations, for more cost-effective agricultural systems.
Climate change:	Management practices for adaptation to, and mitigation of, climate change in agricultural systems.
Land use:	Improved land use and management practices for increasing crop production and minimising land degradation.
Sustainability:	Development of indicators to assess sustainability of cropping systems.

Countries

Country	% of budget: active projects
Vietnam	30
Lao People's Democratic Republic (PDR)	2
Cambodia	1
Thailand	3
Burma	22
Indonesia	10
Philippines	9

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Papua New Guinea (PNG)	23
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Delivery on corporate goals

ACIAR goal, to improve:	Contributions of projects in the Soil Management and Crop Nutrition program (examples)
Food and nutrition security.	<ul style="list-style-type: none"> Promising management practices for sustainable management of resources to increase yields. For example: sweet potato in PNG; vegetables in the Philippines and PNG; grain legumes in Burma; and rice-based cropping systems in Burma and Indonesia.
Productivity and resilience of crop, livestock, forestry and fisheries systems.	<ul style="list-style-type: none"> Profitable crop and livestock systems for south-central-coastal Vietnam and north-eastern Thailand. Increased productivity and reduced risk in maize-based cropping systems in the north-western highlands of Vietnam. Management practices for sustaining productivity, while protecting the environment, of oil-palm production systems in PNG. Improving resource management and increasing productivity of sloping-land agriculture in the Philippines. Identify production systems and more resilient climate variability, Mekong Delta in Vietnam.
Smallholder and community livelihoods.	<ul style="list-style-type: none"> Improving smallholder returns from coffee, vegetables and oil palm in PNG. Improving upland production systems in the north-western highlands of Vietnam Management practices for improving the productivity of legume-based cropping systems for increasing income of smallholder farmers in central dry zone of Burma. Improvement and sustainability of sweet potato–pig production systems to support livelihoods in highland Papua and West Papua, Indonesia.
Animal and plant biosecurity.	<ul style="list-style-type: none"> Integrated nutrient and pest management practices for increasing yields of sweet potato in PNG.
Individual and institutional R&D capacity.	<ul style="list-style-type: none"> Individual capacity building is a component of all projects. The program has 6 postgraduate students associated with projects.

Future focus

The program will continue to emphasise an integrated approach in the identification of promising soil and crop management practices within cropping and farming systems, and the targeting of specific agro-ecological zones. This will intersect with ongoing consideration of socio-economic factors to help develop technologies that allow farmers to optimise the use of local resources to intensify crop production. Policy issues, market and value chains and multidisciplinary approaches will be integrated into project proposals, with current research aiming to identify new research questions and appropriate responses for developing new proposals or scaling up current work.

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