

CCAFS SEA PRIORITY RESEARCH-FOR-DEVELOPMENT INTERVENTIONS

1. Climate-smart agricultural practices

Through participatory action research, CCAFS SEA builds the capacity of local communities and governments in up-scaling CSA (mitigation and adaptation measures) through a smallholder landscape or Climate-Smart Village approach. CSA technologies and practices are integrated with other productivity enhancing interventions to improve the adaptive capacity and livelihood resilience. At the same time, evidence is generated to scale-up the climate-smart interventions beyond selected Climate-Smart Villages.

2. Climate information services and climate informed safety nets

Efforts are being made to understand and act on on-farm delivery systems of climate information needed by end-users and their support networks. Information products like ICT-based agro-advisory service for major food crops in South and South Asia are being applied and tested. Early warning systems for climate sensitive diseases in Vietnam and Laos are being established. Integral in the CCAFS SEA agenda is enhancing the adaptive capacity of women and ethnic minority smallholder farmers through improved agro-climate information.

3. Low-emissions agricultural development

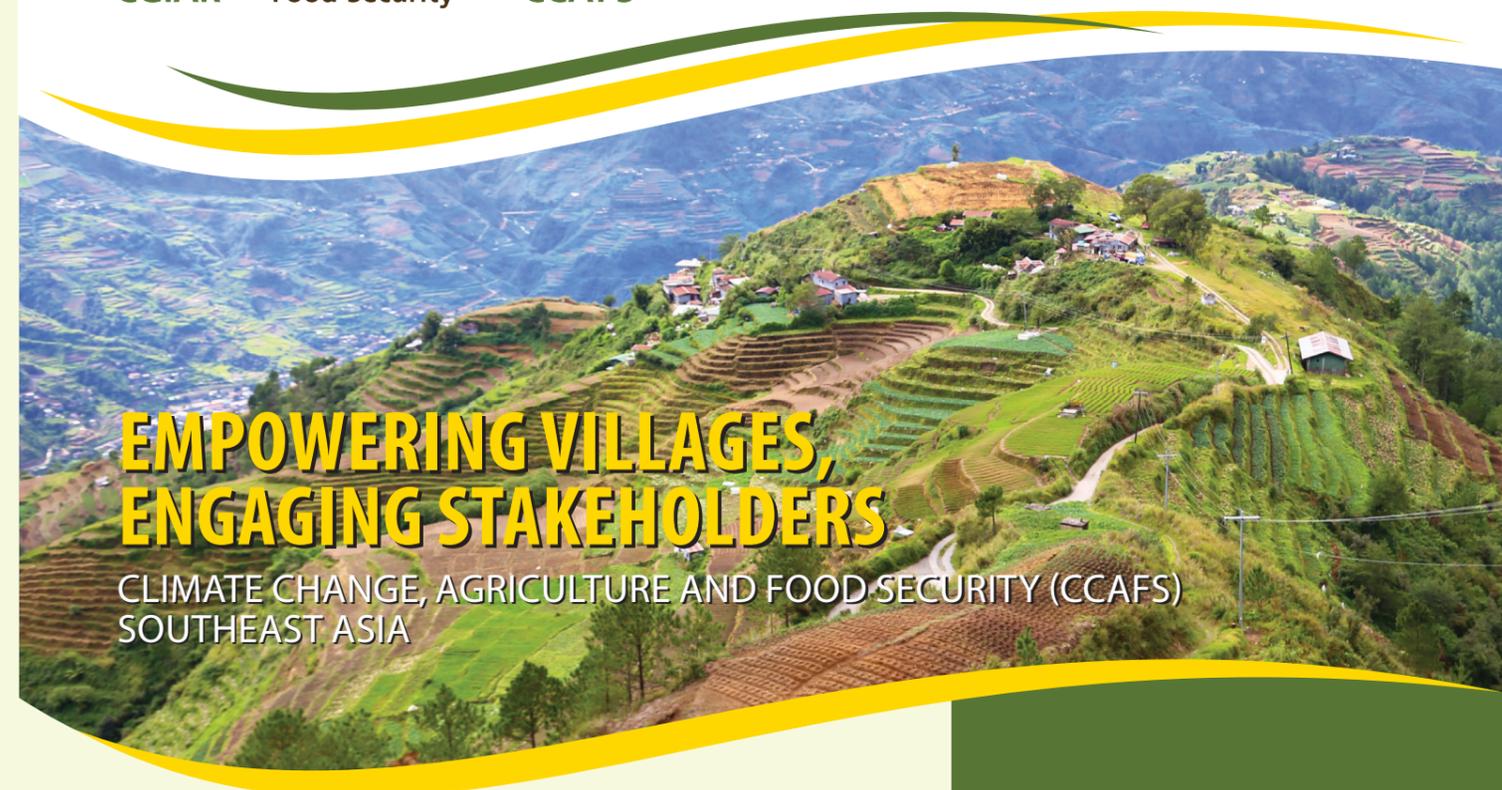
CCAFS SEA supports efforts to reduce GHG emissions in rice-based production systems in Vietnam through the development of approaches/strategies for up-scaling and out-scaling of the alternate wetting and drying technology and the development of quantification procedure or protocols guidelines. Incentives for scaling up of 'no-regret' mitigation strategies among different stakeholder levels are assessed. Improved landscape governance and alignment of plantations and smallholders with best management practices to reduce GHG emissions from oil palm development in East Kalimantan, Indonesia are targeted. Regional support systems (e.g. clearing house) for more effective nationally appropriate mitigation action (NAMA) implementation among Southeast Asian countries are also initiated.

4. Policies and institutions for climate-resilient food systems

CCAFS SEA helps Southeast Asian countries establish decision-support mechanisms on agricultural, climate change, and food security policies using newly generated data and scenarios. The Policy Information and Response Platform on Climate Change and Rice in ASEAN (PIRCCA) and its Member Countries project illustrates the collaborative work and partnerships with the regional economic and development bodies, major regional organizations and the concerned national agencies being undertaken by CCAFS SEA.



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



EMPOWERING VILLAGES, ENGAGING STAKEHOLDERS

CLIMATE CHANGE, AGRICULTURE AND FOOD SECURITY (CCAFS)
SOUTHEAST ASIA

CGIAR RESEARCH PROGRAM ON CLIMATE CHANGE, AGRICULTURE AND FOOD SECURITY

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a 10-year program addressing the daunting challenge of a changing climate to global agriculture and food security.

CCAFS is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT), in partnership with CGIAR research centers, along with National Agricultural Research and Extension Systems (NARES), civil society organizations (CSOs) and the private sector.

Established in 2011, CCAFS brings together the world's best researchers in agricultural and climate science. Initially working in four regions—South Asia, Latin America, West Africa and East Africa—the program eventually included Southeast Asia (SEA) in 2013, hosted by the International Rice Research Institute (IRRI) and based in Hanoi, Vietnam.

CCAFS SEA supports the work of international and local research and development partners toward providing solutions to mainstream policies and practices of Climate-Smart Agriculture (CSA) in the region.



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CGIAR is a global agriculture research partnership for a food secure future. Its science is carried out by the 15 research centers who are members of the CGIAR in collaboration with hundreds of partner organizations.



CCAFS SEA is hosted by the International Rice Research Institute, a member of the CGIAR Consortium.

The program is carried out with funding support from governments and aid agencies, both through the CGIAR Fund and bilaterally.

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CCAFS SEA Vision:

Stable food supply, with consumers, particularly rural and urban poor, having adequate access to food commodities in the region. Farmers and communities practice climate-smart technologies and are resilient to climate change. Institutional capacities and capabilities of the public and private sector in implementing climate change measures are strong. Climate change adaptation and mitigation measures are integrated in regional and national development plans. GHGs measures are integrated in regional and national development plans. These lead to more resilient agriculture in the region with a reduced contribution in GHGs.



Climate-Smart Villages

CCAFS' Climate-Smart Villages focus on climate change hotspots in Africa, Asia and Latin America towards sustainable agricultural development. This is achieved through:

- Strengthening the capacity of farming communities using targeted agricultural technologies;
- Climate information services; and
- Engaging with institutions and policymakers.

THE CHALLENGE FOR AGRICULTURE AND FOOD SECURITY

Although global food production has substantially increased in the past few decades, nearly 870 million people still live in hunger today. Global food production must double by 2050 to match population and income growth and much of this must happen in Asia and sub-Saharan Africa.

SOUTHEAST ASIA – THE CHALLENGE

More than half of the 600 million people in Southeast Asia live in rural areas and depend on agriculture for food and income. While most countries in the region have experienced rapid economic progress, a third of its population remains in poverty.

Climate change in Southeast Asia is projected to increase severe weather events, temperatures and cause sea level rise in many highly populated areas. These changes will adversely affect agricultural yields, biodiversity, forests and availability of clean water. Of the seven Asian countries most vulnerable to climate change, three are in Southeast Asia namely, Vietnam, Cambodia and Lao PDR.

Due to climate change, crop yields in 2050 are expected to decline from 2000 levels by up to 20% for rice, 13% for soybean, 16% for wheat and 4% for maize in East Asia and the Pacific.

Southeast Asia is also a global hotspot for agricultural emissions, particularly from rice and deforestation. Intensified rice cultivation for the growing population leads to increased methane emissions from irrigation. In the

global forest landscapes, oil palm has been a major driver of deforestation, particularly in Indonesia.

To address these challenges, CCAFS, in collaboration with national programs, is partnering with rural communities to develop Climate-Smart Villages as models of local action that ensure food security, promote adaptation and build resilience to climatic stresses. Researchers, local partners, farmers' groups and policy makers collaborate to select the most appropriate technological and institutional interventions based on science, indigenous knowledge and local conditions to enhance productivity, increase incomes, achieve climate resilience and enable climate mitigation.

HOW DO THE CLIMATE-SMART VILLAGES WORK?

Climate-Smart Villages are areas identified as high risk from the effects of climate change and where local research partners are already conducting work. Prior to the project start-up, a Steering Group made up by researchers and village representatives identify 'climate-smart' interventions best suited for that village. The list of activities is introduced to farmer groups and village officials, and the different technologies are prioritized based on yield, resilience potential and other features they find useful. The process is participatory and inclusive as possible, especially encouraging women and more vulnerable groups to participate.

Researchers and farmers continuously monitor and evaluate the activities to fully understand the benefits on farm production, income, resilience, equity, employment, adaptation and mitigation. These are then scaled-up to other farms and villages in the region.

KEY INTERVENTIONS IN CLIMATE-SMART VILLAGES

Climate-Smart Village / Farm					
WEATHER SMART	WATER SMART	CARBON SMART	NUTRIENT AND PEST SMART	ENERGY SMART	KNOWLEDGE SMART
<ul style="list-style-type: none"> • Seasonal weather forecasts • ICT based agro-advisories • Climate analogues 	<ul style="list-style-type: none"> • Aquifer recharge • Rainwater harvesting • Community management of water • On-farm water management 	<ul style="list-style-type: none"> • Agroforestry • Conservation tillage • Land use systems • Livestock management • Alternate wetting and drying 	<ul style="list-style-type: none"> • Site specific nutrient management • Precision fertilizers • Catch cropping/ legumes • Ecological engineering 	<ul style="list-style-type: none"> • Biofuels • Fuel efficient engines • Residue management/ biochar • Minimum tillage 	<ul style="list-style-type: none"> • Farmer-farmer learning • Farmer networks on adaptation technologies • Seed and fodder banks • Market info • Off-farm risk management- kitchen garden

FOCUS OF CCAFS SEA WORK

CCAFS SEA has established Climate-Smart Villages initially in three focus countries—Vietnam, Cambodia and Laos—as they are among the most vulnerable to climate change impacts in the region. The sites represent different climate change challenges and agro-ecosystems. These are also places where CGIAR Centers, government organizations and civil society partners have existing activities and programs.

Countries targeted for future expansion include Indonesia (mitigating the impact of oil palm as a driver of deforestation), the Philippines (risk mitigation and coping with sea level rise in coastal areas), and Myanmar (for rice-based farming systems).

