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

CGIAR

CCAFS

4th Annual Progress Reporting and Coordination Meeting on
CCAFS Projects and Climate-Smart Village Implementation in Southeast Asia

**27 November 2018
Hanoi, Vietnam**

CONTEXT AND RATIONALE

Since its inception in Southeast Asia in 2013, CCAFS has done various interventions with CGIAR Centers, government agencies, NGOs, and local partners in its priority countries, such as Cambodia, Lao PDR, and Vietnam. Likewise, it also implemented specific projects with its partners in Indonesia, Myanmar, and the Philippines. These regional R4D activities are under the following CCAFS Flagships: FP1 – Priorities and Policies for CSA; FP2 – Climate-Smart Technologies and Practices; FP3 – Low Emissions Development; and FP4 – Climate Services and Safety Nets. Moreover, as a regional priority, the Gender and Social Inclusion (GSI) dimensions are integrated in research, planning, and implementation of these interventions.

To serve as "test-beds" for studying climate-smart agriculture (CSA) and take-off points for project implementation, CCAFS SEA piloted the Climate-Smart Village (CSV) model across the region. At present, there are several CSVs established in five Southeast Asian countries, such as: Cambodia (1 CSV), Laos (2 CSVs), Myanmar (4 CSVs), Philippines (1 CSV), and Vietnam (3 CSVs). In Southeast Asia, CSVs have generated evidences of the effectiveness of CSA technologies and practices in real-life settings through systematically co-developing, evaluating, and promoting integrated and innovative CSA portfolios for adoption. The CSV model also provided the framework in establishing climate-resilient communities in the Philippines and CSVs in Myanmar.

As we continue with the goal of ensuring food security amidst climate change in the region, CCAFS SEA is working with its partners to integrate climate change adaptation and mitigation in regional and national development plans. To pursue CCAFS' vision for Southeast Asian agriculture, more strategic R4D activities are being carried out with partners to address the following opportunities and challenges in the region:

- scaling CSA technologies and practices in its priority countries to help them cope with the impacts of climate change;
- promoting resilient and low emission food systems and landscapes, with emphasis on improving food and nutrition security;
- supporting the national and regional agricultural economy to elevate the quality of products to meet international standards through more efficient and productive technologies and practices; and
- mainstreaming CSA in government agriculture policies and programs which respond to regional and national priorities.

As we are now in the second phase of CCAFS, the highlight of this annual meeting was on refocusing our R4D framework and revisiting our program's targets. With the goal of addressing the challenges and opportunities in the region, CCAFS SEA has envisioned to converge the activities of its four R4D flagships in the CSVs towards an integrated set of activities and interventions. Through the presentations of significant outputs and outcomes and the discussions on gap and opportunities, CCAFS SEA would be guided towards a more integrative and effective program implementation.

SPECIFIC OBJECTIVES

The one-day meeting covered the following specific objectives:
1. Report on the progress of activities in the CSV sites and on CCAFS project implementation in 2018;
2. Identify the significant outputs and outcomes of FP/CSV implementation; and
3. Share knowledge, learning, and experiences across CSVs and projects.

OUTPUTS

1. A review of the implementation progress of CSVs/FP in 2018;
2. Identification of emerging outcomes that will be pursued in 2019;
3. Solutions to the identified issues/problems/challenges/gaps in the implementation of the CSVs/FPs; and
4. Discussions on future focus of new projects after 2018.

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PROGRAM

Time	Activity	In-Charge
08:00–08:30	Registration	Secretariat
08:30–08:50	**Opening program**	
	• Welcome remarks	Leocadio Sebastian, RPL, CCAFS SEA
	• Opening remarks	Nguyen Nhu Cuong, Director General DCP Vietnam
	• Introduction	All participants
	• Group picture	All participants
Plenary Session 1: Flagship Projects on Climate-Smart Technologies and Practices **Moderator: Andy Jarvis, CIAT**		
09:00–09:15	**P28:** Integrated agricultural technologies for enhanced adaptive capacity and resilient livelihoods in CSVs of Southeast Asia (Including progress reporting of Ma CSV and AMIA)	Dindo Campilan and Vinh Le Bui, CIAT Asia *(15 mins report)*
09:15–09:30	**P55:** Generating evidence base for upscaling local adaptation through Climate-Smart Agriculture (Including progress reporting of My Loi and Guinayangan CSVs)	Elisabeth Simelton, ICRAF Vietnam/ Rene Vidallo, IIRR Asia *(15 mins report)*
09:30–09:45	**P54:** CSVs in the Mekong Basin: Defining an Innovative and Comprehensive Approach for Catalyzing Roll-out of Large-scale Adoption (Including reporting of Rohal Suong, Ekxang, Pailom, and Tra Hat CSVs)	Reiner Wassmann, IRRI/ Dyna Eam, WorldFish Cambodia *(15 mins report)*
09:45–10:15	Discussion (Q&A)	All *(Presenters are the panelists)*
10:15–10:30	Coffee/tea break	
Plenary Session 2: Flagship Projects on Low Emissions Development and Climate Information Services and Climate-informed Safety Nets **Moderator: Mai Van Trinh, MARD**		
10:30–10:50	**P21:** Assessing incentives for scaling up mitigation at different stakeholder levels: 'No-regret' mitigation strategies in rice production and the Climate and Clean Air Coalition (CCAC)	Reiner Wassmann, IRRI *(20 mins report)*
10:50–11:05	**Bilateral:** Development of LED investment plan for rice	Tran Van The, IAE Vietnam *(15 mins report)*
11:05–11:20	**P249:** Sustainable intensification of dairy production in Indonesia	Titis Apdini, WUR *(15 mins report)*
11:20–11:35	**P48:** Enhancing adaptive capacity of women and ethnic minority smallholder farmers through improved agro-climate information in Southeast Asia	Elisabeth Simelton, ICRAF Vietnam *(15 mins report)*

11:35–11:50	**P264:** Institutional Responses during El Niño Southern Oscillation in the Philippines and Vietnam	Rowena Valmonte-Santos, IFPRI *(15 mins report)*
11:50–12:20	Discussion (Q&A)	All *(Presenters are the panelists)*
12:20–13:30	Lunch break	

Regional Projects (Breakout Session 1) Moderator: Keith Wiebe, IFPRI Venue: Thang Long Ballroom		
13:30–13:45	**P264:** Challenges and opportunities for creating a climate-smart food system in the Philippines and Vietnam	Sam Mohanty, CIP Asia *(15 mins report)*
13:45–14:00	**P264:** The Asia Climate Policy Hub: Developments and strategy in Southeast Asia	Godefroy Grosjean, CIAT Asia *(15 mins report)*
14:00–14:15	**P264:** Assessment of the impacts of climate change on human health and nutrition	Charmaine A. Duante, FNRI *(15 mins report)*
14:15–14:30	**P264:** Adaptation Options for Rice-Based Cropping Systems in Climate Risk-Prone Provinces in the Mekong River Delta	Romeo Labios, IRRI *(15 mins report)*
14:30–14:45	**P264:** Development of climate-related risks maps and adaptation plans (CS MAP) for rice production in the Mekong River Delta	Bui Tan Yen, CCAFS SEA *(15 mins report)*
14:45–15:00	**P264:** Preliminary Estimates of Large Ruminant Enteric Methane emissions in Northern Vietnam	Mai Van Trinh, MARD *(15 mins report)*
15:00–15:15	Coffee/tea break	
15:15–15:30	The Gendered contributions to mitigation (GeMi) in coffee-based agroforestry systems	Elisabeth Simelton, ICRAF Vietnam *(15 mins report)*
15:30–15:45	**P264:** Vietnam's Nationally Determined Contribution In Agriculture Sector: Review And Update	Nguyen Duc Trung, CCAFS SEA/ Ngo Duc Minh, VAAS-IRRI *(15 mins report)*
15:45–16:15	Discussion (Q&A)	All *(Presenters are the panelists)*

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Regional Projects (Breakout Session 2) Moderator: Pablo Imbach, CIAT Venue: Function Room 8		
13:30–13:45	**P264:** Identifying CSA for different provinces in Vietnam and developing the CSV regulations for Ma CSV	Luu Ngoc Quyen, NOMAFSI *(15 mins report)*
13:45–14:00	**P264:** Pest Smart: Strengthening ecosystem health and building resilience of Climate-Smart Villages	Sivapragasam Annamalai, CABI SEA *(15 mins report)*
14:00–14:15	**P264:** Development of training materials on climate-smart rice production for extension staff and rice farmers	Nguyen Viet Khoa, NAEC *(15 mins report)*
14:15–14:30	**P264:** Factors affecting farmer adoption of climate-smart aquaculture in Thanh Hoa, Vietnam	Cao Le Quyen, VIFEP *(15 mins report)*
14:30–14:45	**P264:** CSV Roving Workshop: Developing climate-smart farmers using knowledge-sharing and on-site learning approaches	Nguyen Duc Trung, CCAFS SEA *(15 mins report)*
14:45–15:00	Coffee/tea break	
15:00–15:15	**P264:** Radio broadcasting campaign on CSA in the Philippines	Rogelio Matalang, PFRB *(15 mins report)*
15:15–15:30	**P264:** The radio-based distance learning (school-on-the-air) on CS rice production	Hector Tabbun, DA *(15 mins report)*
15:30–15:45	**P264:** StartUp Project for Climate-Smart Villages (CSVs): Platforms to Scaling Out Climate-Smart Agriculture and Community-Based Adaptation in Myanmar	John Wilson Barbon, IIRR Asia (15 mins report)
15:45–16:15	Discussion (Q&A)	All *(Presenters are the panelists)*

Closing Plenary Session Venue: Thang Long Ballroom		
16:15–16:45	Launching of publications	
16:45–17:00	**Closing Program**	
18:00–	Dinner	

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Highlights of the meeting

EXECUTIVE SUMMARY

Since 2013, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) had generated evidences on the effectives of climate-smart agriculture (CSA) as the approach to innovate and transform agriculture under the changing climate. Next year, CCAFS will enter its second phase, wherein the focus will still be on addressing the challenges and capitalizing on the opportunities in the Southeast Asian region. New projects will be implemented, with the aim to converge these projects under the four research flagships of CCAFS to produce an integrated set of activities and interventions. At the same time, specific outcomes that emerged during the first phase will be scaled to generate more extensive and sustainable impacts in the region.

The *4th Annual Progress Reporting and Coordination Meeting on CCAFS Projects and Climate-Smart Village Implementation in Southeast Asia* convened CCAFS partners and stakeholders in Southeast Asia (SEA) to report the progress of its activities in 2018. *"These partners will help us share and out-scale the outputs that will be presented today,"* Dr. Leocadio S. Sebastian, Regional Program Leader of CCAFS in Southeast Asia, said as he underscored the role of partners to achieve massive scaling and significant outcomes in the region. In this regard, the event served as a platform to identify potential collaborations with the other centers and research programs of CGIAR.

The event was composed of two plenary sessions and two breakout sessions. Plenary Session 1 tackled the flagship projects on climate-smart technologies and practices. Plenary Session 2 featured projects on low-emissions development and climate information services and climate-informed safety nets.

Breakout Session 1 reported the CCAFS initiatives in the farm, policy, and institutional levels, including context-specific adaptation options in Vietnam and its Nationally Determined Contributions to the Paris Agreement. Breakout Session 2 featured activities that promote the scaling and adoption of CSA, including pest-smart practices in CSVs, manuals on climate-smart rice production for extension workers, climate-smart aquaculture in Thanh Hoa, Vietnam, CSV Roving Workshop, radio campaign on climate change for broadcasters, school-on-the-air program on CSA for farmers, and CSA activities in Myanmar.

The CCAFS publications that were published this 2018, as well as those in progress for publication, were also showcased by their authors. The publications tackle climate-resilient technologies and practices in the Philippines; steps to scale CSA based on CSV experiences; pest-smart practices under climate change; CSA in Vietnam; and the gender aspect in climate change research.

Before officially closing the event, Dr. Sebastian emphasized the significance of pursuing outcomes for the second phase of the CCAFS initiative. He reminded the participants to continue working together for them to scale such outcomes and in turn generate extensive and sustainable impacts on the agriculture sector in Southeast Asia.

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OPENING PROGRAM

Welcome Remarks

Dr. Leocadio Sebastian, Regional Program Leader, CCAFS SEA

- CCAFS SEA organized the meeting to convene its public and private partners and discuss the 2018 initiatives that apply climate-smart agriculture. From these initiatives, the Program aimed to develop outputs that it can also share to next-users.
- The initiatives of CCAFS SEA this 2018 were discussed to track their progress, identify the challenges that hinder full-blown success, and the outcomes that they will pursue for next year. These factors will guide the Program to develop a more integrative and effective implementation of its climate-smart initiatives.
- The entire CCAFS system will enter its second phase next year. Dr. Sebastian emphasized that the CGIAR Centers and Research Programs will refocus their R4D framework and will revisit their targets. This is the next key step in achieving food security and enhancing climate resilience in Southeast Asia after implementing climate-smart technologies and practices and integrating climate-smart plans into the national development activities of countries in the region.
- For the meeting, Dr. Sebastian called on the participants to identify opportunities for collaboration and to learn more about CCAFS projects. He also invited the participants to elevate the CCAFS SEA work for its next phase by thinking of how ideas can synergize with one another.

Opening Remarks

Nguyen Nhu Cuong, Director-General, Department of Crop Production (DCP)

- The Southeast Asian region is sensitive to the impacts of climate change. These impacts affect the lives and livelihoods of people, especially the smallholder farmers. Among the impacts of climate change manifesting in the region are more complex pests and diseases. These affect the crop production in Vietnam.
- The Vietnamese government issued policies to facilitate agricultural restructuring in the Mekong River Delta to enhance the climate resilience of the region. Complementing such policies are the CSVs established by CCAFS SEA in the country. CSVs serve as platforms to promote agricultural research, especially research on crop production.
- CSVs also facilitate technology transfer and farmer-to-farmer learning in Vietnam.
- Through the CSVs, climate services provided to the farmers adopt the CSA approach.
- The conference provided an opportunity to look back and share lessons learned from the CCAFS projects this year. More than the projects, the event allowed the participants to learn more about the agriculture sector in the country.
- Through this conference, DCP hoped to work with the participating organizations and donors and extend its network inside and outside the country.

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PLENARY SESSION 1: FLAGSHIP PROJECTS ON CLIMATE-SMART TECHNOLOGIES AND PRACTICES

Moderator: Andrew Jarvis, CCAFS Flagship Leader, Climate-smart Technologies and Practices

- We are on an unsustainable path in terms of agricultural food systems, a major factor of which is agriculture emitting one-third of the total greenhouse gas (GHG) emissions into the atmosphere. Still, agriculture can be the "new oil" of the 21st century if harnessed properly.
- One of the goals of CCAFS today is to identify the CSA technologies and practices (CSA T&Ps) that will work in the 21st century. To identify such CSA T&Ps, CCAFS established CSVs all over the world, with seven of which situated in Southeast Asia. CSVs were designed as "lighthouses" or focus areas of knowledge generation, innovation, and learning. The CSVs are now running for four years and had already provided a solid evidence base for CSA adoption.
- CCAFS aims to produce innovations that will thrive in this century, but it is also looking at "old" technologies and practices that can still address contemporary climate issues.
- Through the CSV and CSA approaches, CCAFS explores the socio-cultural aspect in agricultural transformation and aims to produce empowering T&Ps that farmers and farming communities will take ownership of. Alongside these objectives, CCAFS aims to turn these T&Ps into scalable and sustainable services that millions of farmers will adopt.
- Several entry points are available for wide-scale CSA adoption. It could materialize in the policy level, through market-based incentives, and with certain business models. CCAFS works with its partners to target the appropriate entry point for its CSA T&Ps.

P28: Integrated agricultural technologies for enhanced adaptive capacity and resilient livelihoods in CSVs of Southeast Asia

Vinh Le Bui, International Center for Tropical Agriculture (CIAT) Asia

- Agricultural technologies were developed with local government agencies and research institutions in Vietnam. This included partnerships with the Northern Mountainous Agriculture and Forestry Science Institute and the Vietnam National University of Agriculture, among others.
- The CSA prioritization for testing includes conservation agriculture, sustainable land or natural resource use, and climate-smart rice production. Moreover, technical trainings for CSA T&Ps and initial scaling were conducted from 2015-2017. From these activities, working papers and blogs were written to communicate their results to a wider set of audience.
- For 2018, scientific outputs produced include four journals submitted for publication: (1) Spatial interpolation methods of determination of an 1m DEM for agricultural research (2) Digital soil mapping using an 1m interpolated DEM for the study area in northern Vietnam; (3) Assessment of the effect of grass strips in improving soil fertility and local farmers' livelihoods over different periods of time and management practices in northern Vietnam; and (4) Assessment of the

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triple win of intercropped legumes to restored degraded soils, improved cassava yields and dampened population build-up of herbivorous mites on cassava in northern Vietnam.

- Based on its monitoring and evaluation activities for its 2018 projects, farmers exhibited increased productivity, adaptive capacity, and knowledge on climate change and its impacts.
- For the 2nd phase of CCAFS, the aim is to link the New Rural Development program of Vietnam with the CSV approach to foster a sustainable rural development in Vietnam.

P55: Generating evidence base for upscaling local adaptation through Climate-Smart Agriculture

Rene Vidallo, International Institute of Rural Reconstruction (IIRR) Asia; Le Thi Tam, World Agroforestry Centre (ICRAF) Vietnam

- A nine-step guide was followed to scale CSA in two CSVs in Southeast Asia: My Loi in Vietnam and Guinayangan in the Philippines. These nine steps were grouped into five stages: (1) establish context; (2); identify opportunities (3) generate evidence of CSA benefits; (4) develop learning sites; and (5) scale up.
- Key outputs produced in the CSVs include: eight learning sites/proof-of-concept sites; three key social learning approaches; two scalable support systems; and three major types of upscaling events. The social learning approaches include farmer learning groups, participatory action research, and on-site learning exchange.
- Also produced from these CSVs are a journal article on farmer organizations and CSA, portfolio of My Loi CSV CSA practices, a working paper on the roles of social learning for the adoption of CSA innovations, and guide to implement a community innovations fund.
- Emerging outcomes identified include influence in the development of AMIA Villages in the Philippines and the New Rural Development of Ky Anh District in Vietnam. Moreover, about 238,000 farmers in Ha Tinh Province, Vietnam benefitted from CSA promotion and sub-national-level scaling, as well as 1,500 farmers across 11 villages in the Philippines.
- Future activities include the development of a district-wide CSA project, which will cover 10 municipalities and 50,000 farmers in Quezon, Philippines; and a gender-based project tin Ha Tinh Province.

P54: CSVs in the Mekong Basin: Defining an Innovative and Comprehensive Approach for Catalyzing Roll-Out of Large-scale Adoption

Reiner Wassmann, International Rice Research Institute (IRRI)

- This project aims to transform CSV from a concept into a standardized approach to enhance the resilience of the people at all levels. It covers four CSVs in the Southeast Asian region: Ekxang and Phailom in Lao People's Democratic Republic (PDR), Rohal Suong in Cambodia, and Tra Hat in Vietnam.

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- In Ekxang CSV, site-specific options for home-based vegetable systems were integrated into the tool applied to the villages in the greater Mekong region. An optimization model was then adjusted with field data to craft a rainwater storing system that cuts costs and reduces risks of water shortages.
- In Phailom CSV, community-based rice seed systems are the priority. Training events such as seed fairs and farmer field schools were organized to equip the community with the necessary skills to implement this system. Among the notable methodologies used in this project was the photovoice, a participatory activity that documented farming experiences and issues using photos taken by the farmers.
- Rohal Suong employs more participatory approaches on farms. These approaches are adopted in prioritizing and planning CSA activities. After testing climate-resilient and low-emissions technologies, more and more farmers are now adopting CSA. International partners, governments, private sector, and other key actors in the field were all crucial in promoting, piloting, testing, and scaling CSA options.
- In Tra Hat, collaborative approaches are followed, wherein promising CSA options are identified with the farmers. Among the promising options were mushroom cultivation based on rice straw. This option is primarily preferred by the women in the households.

Discussion Highlights on Plenary Session 1

CSV leaders were invited to speak of their experiences in their community. A village leader from Ha Tinh shared that CCAFS programs brought new approaches and technologies that they believe are environmentally-friendly. Moreover, farmers were trained on protecting their environments and understanding the different stages of crop growth to better respond to climate change. Market outlets were also established for the farmers to sell CSA products.

A question-and-answer portion was also organized about the first set of presentations. Below were the highlights of the discussion:

- The 2nd phase of CCAFS is linked with the Sustainable Development Goals, specifically Goal 13 that calls for actions on climate change and its impacts.
- CCAFS developed a monitoring and evaluation framework to measure and identify impacts of its projects.
- Although the outputs of My Loi and Guinayangan CSVs are different from each other, CCAFS is exploring T&Ps that it can scale on a broader audience.
- The concept of CSV is new to the Southeast Asian region. CSVs must show evidence of enhanced resilience to climate change and reduced emissions of GHGs to encourage farmers to adopt CSA T&Ps. These CSA services must also tackle social differences and economic risks, among others.
- The latest report of the Intergovernmental Panel on Climate Change about a 1.5°C of global warming warns of the potential irreversible impacts of climate change. Through the CSA and CSV approach, farmers are smarter than before, and local governments now join climate-smart

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initiatives. The challenge today is to integrate these initiatives systematically to foster scaling of more sustainable climate actions.

- Crop insurance in Vietnam is nothing new but still not easy to implement. Support systems are needed, as well as integration with other national agriculture plans.
- Climate-smart tools must be utilized to conduct baseline studies that will measure GHG emissions. From such studies, countries can strategize how to reduce their emissions and mitigate the impacts of climate change.
- Responding from a hypothetical scenario where they will receive USD 100 million, the panel said that they will focus on rice investments, massive scaling of CSVs, agricultural markets, and CSA planning.
- Dr. Sebastian shared that CCAFS developed an eight-step guide to establish a CSV then encouraged the participants to look at it and give them feedbacks.

PLENARY SESSION 2: FLAGSHIP PROJECTS ON LOW EMISSIONS DEVELOPMENT AND CLIMATE INFORMATION SERVICES AND CLIMATE-INFORMED SAFETY NETS

Moderator: Mai Van Trinh, Ministry of Agriculture and Rural Development

- Agriculture is a major contributor to GHG emissions, which leads to climate change.
- Several international commitments were already signed to combat climate change, the most significant of which is the Paris Agreement.
- Through this research flagship, CCAFS aims to mitigate the impacts of climate change on the agriculture sector. This involves working with partners to measure GHG emissions, identify the low-emission potential of CSA options, and support policies, incentives, and funding options on low emissions development, among others.

P21: Assessing incentives for scaling up mitigation at different stakeholder levels: 'No regret' mitigation strategies in rice production and the Climate and Clean Air Coalition

- This project aims to examine the potential of mitigation options, specifically the alternate wetting and drying in rice, the pros and cons of adopting low-emissions technologies, and understand how modernization or mechanization and mitigation influence each other.
- Mitigation options were met with promising feedbacks from the end-users. Specifically, the alternate wetting and drying (AWD) was the focus of the study, together with the incentives and costs for adopting such technology, and the relation between mechanization and mitigation.
- The project objectives are to: (1) tackle innovative technologies, management options, and farmer business models for rice straw management; (2) analyze carbon footprint of alternative rice straw management against a baseline of GHG emissions from straw burning; (3) discuss carbonization of straw or biochar as a new approach to lower the footprint and increase

income; (4) discuss methodologies for and results from sustainability assessment for promising rice straw management options; and (5) devise strategies on communication and outreach to disseminate the results.

- The "Inclusive and Sustainable Rice Landscapes" was launched to increase the production of rice in the world and meet the growing global demand for rice.

Bilateral: Development of LED investment plan for rice

Tran Van The, IAE Vietnam

- The Mekong River Delta is a key region for rice production in Vietnam. Among the climate challenges that threaten the rice production in the region are droughts, salinity intrusion, and floods. However, rice production is a major emitter of GHGs into the atmosphere, accounting for almost half of the agricultural emissions of the country.
- One low-emissions development technology for rice is the alternate wetting and drying (AWD). A feasibility analysis was conducted to see the potential of AWD in the region. This analysis examined geographic suitability and identified barriers to adoption, as well as incentives and enabling conditions to encourage large-scale adoption.
- Several barriers on AWD implementation were identified: funds to develop policy and mobilize resources for mitigation options; correct pricing of rice that will grow from AWD, and costs of AWD implementation.
- To address these barriers, several investments plans are proposed: enabling policies to facilitate AWD implementation; capacity building activities policy makers, private partners, and farmers; enhanced capacity to implement the country's Nationally Determined Contributions; and stronger collaborations among relevant actors.
- AWD possesses a potential in terms of reducing GHG emissions from rice production and improving the productivity of agricultural lands that in turn will increase the incomes of the farmers.

P249: Sustainable intensification of dairy production in Indonesia

Titis Apdini, Wageningen University and Research

- The Sustainable intensification of dairy production in Indonesia (SIPDI) aims to increase the incomes of farmers and in turn improve the livelihoods of smallholder dairy production systems in West Java, Indonesia. Specifically, SIPDI aims to increase the productivity of herd and cows; improve resources use efficiency; and reduce GHG emissions.
- In 2016, mitigation options were identified, which were then subjected under feasibility testing from 2017-2018. Also, during this period, capacity building and communication activities were conducted to prepare the project for the scaling phase, which will be conducted from 2019 onwards.
- Surveys on GHG emissions, scenario studies, and mitigation strategies were crafted through the SIPDI project. From these supporting studies, the following outputs were produced this year alone: reports in the form of master's theses on the preliminary effects of interventions on

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productivity, resources efficiency, and GGH emissions; training materials on feeding and manure management; new technologies on small-scale composting for farmers; and scientific publications on the economic value of manure as a fertilizer and entry points for mitigation options on small-scale dairy farms.

- Aside from these main outputs, the project is expected to produce the following: guidelines on improved feeding and manure management, cases on business investments, designs for credit schemes, policy briefs, and more publications.

- For the private sector, the emerging outcomes include a dairy cooperative with 4000 farmers, who will monitor the manure on their farms and raise funds for manure management; training of extension workers; and a dairy development program that will involve 250,000 farmers across eight countries. In the policy level, the Citarum River Program was launched, which is supported by the International Monetary Fund and the Asian Development Bank. The project was also able to advise the Indonesia government on dairy waste management, dairy cooperatives, and knowledge centers.

- A new project will be launched, which will upscale low-emissions development initiatives on both large-scale and small-scale dairy farms in Indonesia and explore fungi treatment for lignin degradation of low-quality biomass, among others.

P48: Enhancing adaptive capacity of women and ethnic minority smallholder farmers through improved agro-climate information in Southeast Asia

Elisabeth Simelton, Project Leader, ICRAF Vietnam; Phuong TH Dinh, Climate Change Specialist, CARE International Vietnam

- The project, Agroclimate Information Services (ACIS) for women and ethnic minority farmers, aims to improve the actionability of climate services by examining their availability, accessibility, timeliness, understandability, and usefulness.

- The ACIS was a combination of scientific and local knowledge, which fostered participation of communities and ownership of the climate services. Farmer champions were tapped to disseminate information about the project and promote this project.

- The climate services were readily available and were packaged in various formats such as posters, mobile messages, and online advisories. To improve the accessibility of these services, farmers were trained, together with farmer champions, local organizations, and village meteorologists. Climate services were ensured to be on-time as well for the farmers to receive relevant advisories and climate information. The project also ensured that the end-users understand the information through participatory scenario planning and reflection activities. As a result, the advisories were deemed useful by the farmers.

- Farmers were appreciative of participatory scenario planning because it allows them to learn from one another.

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P264: Institutional responses during El Niño-Southern Oscillation in the Philippines and Vietnam

Rowena Valmonte-Santos, International Food Policy Research Institute (IFPRI)

- The 2015-2016 El Niño-Southern Oscillation dealt major damages on the agriculture sector of Vietnam and the Philippines. As a response, Vietnam released the Special News on El Niño 2015 and an Assessment of Hydro-Meteorological Trend from September 2015 to February 2016 while the Philippines developed the Roadmap to Address the Impact of El Niño.
- The focal point of the Philippines for its El Niño responses is the National Economic and Development Authority, in partnership with the Department of Agriculture, Philippine Atmospheric, Geophysical and Astronomical Services Administration, Climate Change Commission, National Disaster Risk Reduction and Management Council, and local government units, among others. For Vietnam, it taps the Ministry of Agriculture and Rural Development, Ministry of Natural Resources and Environment, and the Ministry of National Defense.
- IFPRI simulated policies to address the ENSO phenomenon. The Institute also suggested a portfolio of on-farm, market, and social policies to offset the ENSO damages to agriculture.
- To improve the preparedness of the two countries against ENSO, they must develop risk maps, enhance their forecasts and early warning systems, improve existing plans, and strengthen the capacity of local governments. Moreover, financing mechanism must be explored for immediate response to ENSO and for farmers' awareness and adaptive capacity. These must be complemented with improved rural infrastructures to allow response agencies to immediately go to affected communities.

Discussion Highlights on Plenary Session 2

- AWD was called intermittent irrigation during the first few years of its implementation. It was initially developed as an adaptation option for rainfed areas to save water from water pumps. Only later was it discovered to possess the potential to reduce GHG. AWD then must be explored to utilize its adaptation and mitigation potentials.
- Challenges will arise at the start of AWD implementation. The key is to address interrelated issues such as farmer uptake, costs of implementation, and potential benefits for farmers to overcome any challenges. Specifically, policies can act as enabling factors if they state farmers benefits clearly, which will facilitate quick mobilization of resources.
- Dialogues and consultations with governments must occur at all levels to maintain partnerships and collaborations. Building and strengthening these partnerships and collaborations, however, take time. CCAFS is dedicated to keep its communication lines open for more partnerships and collaborations that can help integrate climate actions into government plans and strategies.
- CSA options will only be effective if governments combine early warning systems and climate-smart risk maps. These tools will enable farmers on their decisions for their farmers and help them better respond to climate change impacts.

BREAKOUT SESSION 1

P264: Challenges and opportunities for creating a climate-smart food system in the Philippines and Vietnam

Sam Mohanty, International Potato Center Asia

- This initiative covered the Philippines and Vietnam. Specifically, four provinces (Tarlac, Nueva Ecija, Leyte, and Samar) were selected in the Philippines while four provinces (Thai Binh, Bac Ninh, Tra Vinh, and Bac Lieu) were also selected in Vietnam.
- The methodology follows a mixed methods research wherein quantitative and qualitative data collection and analysis were both used. The data generated from the two methodologies were analyzed and compared with each other to come up with an interpretation. The quantitative data analyzed was the supply transformation and consumer demand while the qualitative data was agricultural production and policies and market structures.
- The seasonal calendar was used to understand livelihood and agricultural activities, seasons prevalent in the community, workload, and division of labor between men and women. In Thai Binh Province, for example, this tool can be utilized when identifying location-specific risks, existing agricultural practices dedicated for the crops and the corresponding adaptive practices against climate threars.
- In Tarlac Province in the Philippines, farmers prefer short-duration rice varieties to avoid the damages brought by the typhoon seasons. Damages and losses already occurred in the province, including pest outbreaks on sweet potatoes due to excessive rainfalls. The poultry sector of the province was also affected as chickens suffer from heat stroke.
- In Samar and Leyte, the farmers viewed rice as the most important crop; however, due to climate change, they had already experienced major damages and losses. The losses lead to a decrease in supply of commodities and in areas dedicated for rice production. As a response, there are already farmers who shifted from rice to vegetable production.
- The information node assessment tool shows the type of information relevant to the communities and the sources where users can access the information. The information included weather forecasts, agro-advisories, crop management practices, biotic and abiotic stresses and the tolerant varieties, pest-and-disease management, integrated pest management, water-saving technologies, crop insurance, and credit. Sources include the agriculture office of the district, extension workers from the government, money lenders in the community, input dealers, non-government organizations, community leaders, farmer champions, and even the radio.
- For this initiative, reports and briefs on the food systems of the eight provinces will be written; policy dialogues will be also organized for policy makers, government officials, experts, and other stakeholders.

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P264: The Asia Climate Policy Hub: Developments and strategy in Southeast Asia

Godefroy Grosjean; James Giles; Tam Ninh Nguyen; Paula Macandog; Sekou Traore; Nick Beresnev; Miguel Lizarazo; Peter Laderach, CIAT

- The annual cost of adaptation in agriculture by 2050 will be USD 225 billion globally. Such massive fund shall be utilized to bring adaptation options to vulnerable countries. The Asia Climate Policy Hub (CPH) is a platform to scale CSA. The CPH's scaling strategy involves: CSA investment planning, de-risking agriculture through CSA-credit-insurance nexus, and policy engagements.
- The CPH had already assisted in developing country profiles on CSA or Climate-Resilient Agriculture. It had already covered more than 30 countries globally. The CSA Investment Planning in Bangladesh was showed to develop a model for policy makers. The Bangladesh profile includes looking at four scenarios, all of which tackle different technologies dedicated for the various sub-sectors of agriculture.
- These technologies will be packaged to create enabling conditions that will facilitate the achievement of policy goals in agriculture: emission reduction, poverty reduction, and food security, among others.
- For the de-risking of agriculture through CSA-credit-insurance nexus, the Philippine case was used as a model. In this element, climate risks insurance has lower premiums, the CSA credits have lower interest rate, and the climate-smart technologies and practices showed a high adaptive capacity to climate change. Together, they will diversify and reduce the risks being experienced by Filipino farmers.
- Several policy engagements also occurred through the CPH, including two papers tackling the Nationally Determined Contributions of Vietnam. A subnational engagement also happened during the launch of the CSA profile of Punjab. Lastly, a report that synthesized global data on CSA trends was written.
- Through the CPH and other tools and methodologies, CCAFS will work with partners to scale CSA. As they go through this process, CCAFS will aim to develop new methodologies and other initiative to utilize the available climate finance for CSA and to reduce the risks posed to the agriculture sector. Policy engagement manifested in various levels will serve as the foundation for this initiative.

P264: Assessment of the impacts of climate change on human health and nutrition

Charmaine Duante, Department of Science and Technology-Food Nutrition Research Institute

- Extreme weather events due to climate change dealt major damages to the Philippines, disrupting its food systems and affecting its nutrition and health status. This initiative aims to assess the effects of exposure of Filipino households to these events in relation to their health and nutritional statuses. The results contributed to the adaptation and mitigation efforts conducted by the Philippine government for the vulnerable communities.

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- The outcome of this initiative was the recommended energy intake for households based on energy deficiency among adults and lactating mothers, nutritionally at-risk pregnant women, and children below 59 months.
- Results showed that socio-economic status, household size, food security, socio-demographic characteristics such as age, sex, and civil status, as well as exposure to climate risks are strongly related to nutritional outcomes
- Chances of having stunted children, energy deficiency, and risks among pregnant women are high for those who belong to the poorest and large households that also exhibited food insecurity. Specifically, in Mindanao, exposure to droughts in 2015 or 2016 increased the likelihood of stunted children below five years old. Such results can be crucial in developing the climate actions in the Philippines. These will enable the Philippine government to strategize based on the challenges faced by the vulnerable communities.
- The initiative suggests that cohort data will help people understand the effects of being exposed to climate change.

P264: Adaptation options for rice-based cropping systems in climate risk-prone provinces in the Mekong River Delta

Romeo Labios, IRRI

- CCAFS SEA and Vietnam's Department of Crop Production partnered to develop climate-related risk maps and adaptation plans for the 13 provinces in the Mekong River Delta. The Department recommended the use of the risk maps to develop the adaptation plans for rice production in the country.
- For the development of the risk maps and adaptation plans, a desktop study was first conducted, followed by focus group discussions with the provincial offices of the Department of Agriculture and Rural Development. Afterwards, field visits were organized to talk with farmers about the risk maps and adaptation plans.
- From these activities, a list of adaptation options for different risks and scenarios was developed. Each option provides its technical feasibility. The current capacity needs for implementation was also recorded, together with the relevance of the adaptation plans to development of polices and programs of the Mekong River Delta pertaining to its agricultural production. However, several key issues were identified, including the failure to consider climate change-induced impacts, the unstable and unpredictable prices of agricultural products, lack of linkages between markets and farmers, lack of knowledge and skills to grow new crops, and spontaneous shifting from one cropping system to another.
- Agricultural transformation is suggested to cope with climate change impacts. Such transformation must be context-specific, catering to the geographic, socio-economic, and agro-ecological needs of the target community. Included in this transformation is building supply chains through farmer organizations and linkages to reduce risks. Investments must also increase to better mobilize resources and implement the adaptation plans of the region. Funds

for these investments may come from international partners, private sector, and public-private partnerships, among others.

- Mapping of risks must be conducted at lower levels (district, local) to allow farmers and local authorities to adjust their cropping calendars. A shift is also suggested, if it is appropriate and will address the risks posed by climate change. At the top of all these proposed activities is the rice restructuring plan of Vietnam, which will cover 2020 up to 2030.
- The assessment of the activities will be reported to the DCP and to the MRD provinces in December 2019. The assessment report, meanwhile, will be finalized in January 2019. It will be disseminated to a wider audience the following month.
- The team included Dr. Bui Ba Bong (former Vice Minister, MARD; Team Leader); Dr. Nguyen Van Bo (former President, Vietnam Academy of Agricultural Sciences); Dr. Nguyen Hong Son (Director General, Department of Crop Production); Mr. Le Thanh Tung (Representative, DCP Southern Office); Dr. Trinh Quang Tu (Vietnam Institute of Fisheries Economics and Planning); Dr. To Quang Toan (Senior Researcher, Southern Institute of Water Resource); Dr. Leocadio Sebastian (Regional Program Leader, CCAFS SEA); Dr. Bui Tan Yen (Science Officer, CCAFS SEA); Mr. Nguyen Duc Trung (Associate Researcher, CCAFS SEA); and Dr. Romeo Labios (Consulting Scientist, IRRI/CCAFS).

P264: Development of climate-related risks maps and adaptation plans (CS MAP) for rice production in the Mekong River Delta

Bui Tan Yen, Soils and Fertilizers Research Institute, Vietnam

- The Mekong River Delta is the major agricultural region in Vietnam, contributing 56% of the national rice production. With the region accounting for more than half of country's rice production, it also contributes 90% of rice exports. However, the region is also one of the give most vulnerable areas to the impacts of global warming as reported by the Intergovernmental Panel on Climate Change in 2007. The impacts prevalent in the region are floods and salinity intrusion.
- In this regard, a need had emerged to identify climate risks and develop corresponding adaptation plans. To develop the plans, a multi-stakeholder dialogue approach was adopted for this initiative. Science-based information, the biophysical characteristics of the MRD provinces, and local knowledge were integrated to develop the risk-based adaptation plans, including a new cropping calendar for the MRD.
- Upon development of the risk maps, the DCP called on the MRD provinces to craft action plans for the adaptive rice-based systems and cropping calendar. Currently, this call is in progress. Provinces such as Tien Giang, Long An, An Giang, and Dong Thap already operationalize the adaptation plans. These plans, as well as the risk maps, were downscaled to the 13 provinces. More activities at the lower levels will be integrated into the national program of Vietnam.
- The CS MAP can be used to identify other risks on other agricultural products. It was designed in a way that it can be updated annually and support the implementation of a nationwide adaptation plan on agriculture.

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P264: Preliminary estimates of large ruminant enteric methane emission in Northern Vietnam

Prof. Dr. Mai Van Trinh (IAE); Dr. John Goopy (International Livestock Research Institute [ILRI]); Dr. Vu Duong Quynh (IAE); Dr. Tran Hiep, Vietnam National University of Agriculture (VNUA); Dr. Cu Thi Thien Thu (VNUA); Mr. Vu Pham Thai (IAE); Mr. Nguyen Viet Hung, (ILRI)

- This activity aims to produce a new approach to improve the emissions factors for enteric methane emissions of cattle in smallholder systems in Vietnam. Specifically, it aims to identify options to increase the productivity of cattle in Ba Vi Province, located in the northern part of Vietnam, while decreasing emission intensities.
- This is composed of eight key steps: (1) identify animal for testing; (2) estimate animal age; (3) determine the body score condition; (4) measure the heart girth; (5) measure live weight; (6) get a sample of grass; (7) get a sample of animal feed; and (8) interview farmers. Through the last step, the physiological status, daily milk production, and manure management of the farmers were identified. These are key information that will help craft strategies to mitigate methane emissions among cattle.
- Results show that methane emissions are high among dairy cows. Beef cattle emits the lowest amount of methane among the animals covered in the study. In terms of seasons, the largest amounts of methane were recorded during the winter due to the need of animals for more energy. In contrast, the lowest emissions were recorded in spring due to the fast growth of grass, which gives methanogenic organisms short time to produce methane.
- The beef cattle emit the largest amounts of methane during summer, followed by spring, and autumn. Consequently, emissions are at the lowest during winter. This is due to the heavier diet that the cattle consume during winter, as well as autumn. Still, the effects of the seasons on the amounts of methane emitted by the buffaloes were not clear. This might be due to the low number of animals covered in the study.

The Gendered contributions to mitigation (GeMi) in coffee-based agroforestry systems

Tuan Minh Duong, ICRAF; Ly Huong Tran, CARE International

- This project aims to evaluate the impacts of the Village Saving and Loan Association (VSLA) partnered with coffee-based agroforestry training on the following: women empowerment, household welfare, value chain dynamics, and climate change mitigation. NOMAFSI, the Centre for Community Development in Dien Bien, the Department of Agriculture and Rural Development, as well as the Technology Enhanced Agricultural Livelihood project, was involved in *GeMi.*

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- The baseline study surveyed 324 households. A total of eight focus group discussions with groups of men and women were also conducted. Participants were either a member (intervention group) of a VSLA or not (control group).
- Results show that both men and women participate in coffee production, but the division of labor is based on norms, i.e., women perform the tasks socially assigned to them; men do the same. However, men decide on major issues pertaining to agricultural investments in the households. Overall, the participants express their willingness to learn the several activities on the fields, including guidance on production, management of production diseases, market prices, market demand, agro-climate information, and government policies, among others.
- The training materials were co-developed with the farmers, which include tools on gender and financial literacy, poster making about pests and diseases, nutrient management on coffee, coffee-based agroforestry systems, and coffee harvesting. Complementing these materials was a guiding video on managing the coffee-based agroforestry systems.
- From this study, women showed that they can participate and benefit from the coffee value chain. What they need is join the dialogues, raise their awareness on key issues, and change their behavior in terms of household work. The financial literacy training and the tools on coffee agroforestry can help them take ownership of the tasks previously assigned only to men.
- The study had also seen that VSLA served as an enabling platform for the participants to learn financial literacy, business skills, contract engagement, and collective bargaining. From these emerging outcomes, more trainings will be organized in 2019, which will discuss gender dialogue and more financial literacy. A peer-reviewed paper will be written to show the role of savings and loan organizations in Vietnam in improving women's access to markets.

P264: Vietnam's Nationally Determined Contribution in Agriculture Sector: Review and Update

Nguyen Duc Trung, CCAFS SEA; Mai Van Trinh, Institute of Agricultural Environment; Ngo Duc Minh, VAAS-IRRI

- The proposed mitigation technologies for the agriculture sector in the NDC include alternate wetting and drying, improved diets for dairy cows and buffaloes, midseason drainage, shifting from rice-based systems into rice-shrimp or upland crop systems.
- The challenges existing in the Vietnam context are the lack of technical capacity and skills of human resources to manage mitigation options, high investment costs of mitigation options, and downscaling from national to sub-national levels.
- These challenges can be addressed through multi-stakeholder collaborations focused on mainstreaming NDC targets, supporting the development of guidelines in planning NDC activities at various levels, examining the suitability of mitigation options in different ecological zones, and building the capacity to implement a sectoral-level Monitoring, Reporting, and Verification system for the agriculture sector.

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- The outputs already produced for this initiative were a working paper on the challenges to implement Vietnam's NDC on its agriculture sector under the current policies, a journal article, and a training for the World Wildlife Fund.
- The next activities include an analysis of the NDCs of Southeast Asian countries, as well as a training workshop on NDC in the agricultural sector for Thailand and Indonesia.

Discussion Highlights on Breakout Session 1:

- Qualitative methods such as focus group discussions and key informant interviews were used to understand the practices and behaviors of the farmers. Aside from understanding the farmers, the different stages of value chain were studied. From the study, context-specific CSA technologies can be applied.
- The mitigation aspect is as crucial as adaptation in the NDC since it also brings benefits to farmers. CSA technologies and practices that bring mitigation benefits are available, but CCAFS is conducting a study on the feasibility of mitigation options. Still, prioritizing CSA implies feasibility already. Moreover, local governments had devised mitigation strategies that must be integrated into the country's NDC.
- Savings and loan groups allowed the women to gain more capital and access to financial resources.
- For the CS MAP, local knowledge was utilized instead of simulations, models, or any other validation means. The goal was to develop forecasts based on the sustainable collaborative efforts of both experts and farmers. Through participatory approaches, CCAFS was able to alter the proposed calendars to the farmers to make them more suitable to the needs of the farming communities.

BREAKOUT SESSION 2:

P264: Identifying CSA for different provinces in Vietnam and developing the CSV regulations for Ma CSV

Dr. Luu Ngoc Quyen & Le Khai Hoan

- This 2018, CCAFS maintains its support for Ma Village, one of the seven CSVs in Southeast Asia. Such support extended to the development and implementation of appropriate CSV regulations in Ma CSV. The regulations tackle the adoption of sustainable CSA practices, environmental protection, management of community assets, development and management of community funds, fines and incentives for the implementation of the regulations, and rights and responsibilities of villagers.
- Scaling of CSA practices all over Vietnam was facilitated by examining their suitability to local contexts.

- A list of priority CSA initiatives were developed to identify those that suit the contexts of the areas where they will be applied. Aside from local context, the suitability of the CSA initiative on the national adaptation plan and the intended nationally determined contributions was considered as well.
- Priority CSA options were grouped into six categories: pest control and production; protection and sustainable use od cultivated land and water resources; agroforestry and integrated cropping systems; paddy rice production; livestock production; and aquaculture production.
- Plans in the pipeline include the launching of CSV regulations and developing a database on priority CSA practices and systems in Ma CSV. Information that will be stored in the database include the areas where the CSA option is adopted, its impacts, and challenges to implementation, as well as areas where it can be promoted, the scaling needs of the option, potential barriers and challenges, and their corresponding solutions.

P264: Pest Smart: Strengthening ecosystem health and building resilience of Climate-Smart Villages

Dr. Sivapragasam Annamalai, Centre for Agricultural Bioscience International

- Dr. Annamalai said that scaling CSA initiatives will be met with many cross-sectoral engagements and issues that musts be addressed. The path through a successful scaling is not linear; hence, they must all work together to identify and overcome challenges that will hamper their works.
- Climate change breeds pests and diseases (P&D) that are now more difficult to control. P&D deal direct and indirect damages and losses on crops. Farmer livelihoods and incomes are then affected by P&D due to the complex and unpredictable nature of climate change-induced P&D. Contributing to the emergence of such pests and diseases are the farmers, with their current practices emitting GHGs into the atmosphere. The key to address this issue is to adopt climate-smart practices.
- A pest-smart approach asks the following questions: Are the current crop-based systems in the CSVs resilient to pest outbreaks rooting from climate change? Are women and other marginalized sectors participating in decision-making processes? Are farmers benefitting from the existing tools and frameworks on communication and extension? Are the current pest control practices environmentally friendly and sustainable? To answer these questions, P&D in Tra Hat, Rohal Suong, and Ekxang CSVs were subjected under pest-smart practices.
- The main output o this project is the manual, "Pest-smart practices and early warning system under climate change," which was written in local languages and will be distributed in CSVs. The other activities include surveys on the knowledge and adoption of pests-smart practices among farmers, school awareness day, training on biocontrol for plant doctors in Ekxang CSV, and geographic scaling of ecological engineering.

P264: Development of training materials on climate-smart rice production for extension staff and rice farmers

Dr. Nguyen Viet Khoa, National Agriculture Extension Center (NAEC)

- NAEC conducts extension projects on the agriculture sector of Vietnam, which include activities on technology transfer and collaborations among countries in the Southeast Asian region.
- A study from the Ministry of Agriculture and Rural Development reported that rice yield might decrease by up to 4.3% from 2016-2045 due to the impacts of climate change. Specifically, sea level rise brought by climate change may sink agricultural lands dedicated for rice cultivation. The production of rice, however, is a major contributory factor to climate change. As of now, no official manual or curriculum is available for extension workers to conduct adaptation and mitigation activities for rice production.
- To address this problem, training materials for extension workers were developed. These materials tackle sustainable rice production. Complementing these materials is a training manual also dedicated for extension workers for them to be capable enough to implement a sustainable production of rice. These outputs were tested and revised based on the feedbacks and comments of respondents. NAEC will release an official statement about the use of the outputs.
- The materials tackle climate change and GHG emissions from rice production, cropping calendar, water management, nutrient management, pest-and-disease management, rice value chain and financial management in the household level, and skills-centric training for adult farmers.
- Agricultural extension workers in all levels, particularly in the provincial level, are expected to benefit from the materials.

P264: Factors affecting farmer adoption of climate-smart aquaculture in Thanh Hoa, Vietnam

Cao Le Quyen, PhD, Team leader; Tran Van Nhuong, PhD; Nguyen Duc Trung, MSc; Trinh Quang Tu, MSc; Phan Phuong Thanh, MSc; Le Thi Thu Huong, MSc

- In 2015, five on-farm testing of climate-smart aquaculture (CSAq) were conducted in Hoang Phong Commune, Thanh Hoa Province. The CSAq testing focused on introducing *tilapia* to improve shrimp farms. The following year, a total of 122 aquaculture farms adopted CSAq within the project site and its neighboring communities. In 2017, integrated CSAq systems in Thanh Hoa Province were analyzed in terms of their value chain. This 2018, factors influencing the adoption of CSAq were identified in the North Central Coast Region of Vietnam.
- A probit model was applied to measure the factors influencing CSAq adoption. This model toots from capital and credit facilities, training, agricultural extension services, market availability, demographic characteristics, and perceived benefits. Moderating factors such as government policies and cooperation of the community were also considered for this model.

- For the data collection, 182 aquaculture farms with and without *tilapia* in Thanh Hoa Province were covered. The variables included in the data collection are gender, educational attainment, occupation, experiences on aquaculture, size of ponds, revenue, water condition, knowledge on CSAq, seed access, economic efficiency, food security, use of feeds, chemicals, and waste, market price, access to information, and if the respondent is a member of a cooperative.
- Six influencing factors were identified: household members, economic efficiency, improvement of ponds, market price of CSAq products, access to technical information, and food security. Economic efficiency is the most influencing factor, followed by improvement of ponds, and market price. In this regard, support must be provided to the farmers to improve economic efficiency; farmer awareness on CSAq must be raised; and value chain linkages of CSAq actors must be promoted to improve the market price of CSAq products.
- CSAq farming will be improved by teaching farm management skills, risk management, farm recording, and processing of climate information, among others. These will be supported with dialogues and other forms of discussions among key CSAq actors such as the farmers, middle men, and processing companies.

P264: CSV Roving Workshop: Developing climate-smart farmers using knowledge-sharing and on-site learning approaches

Nguyen Duc Trung, CCAFS SEA

- The CSV approach aims to develop technologies, information services, local knowledge, and development plans that will mobilize the farmers to better respond to climate change impacts. These outputs are anchored on CSA, the transformative approach that enables the agriculture sector thrive under the new climate conditions.
- A roving workshop is a learning platform that allows farmer-to-farmer learning, as well as farmer-expert discussions. This activity aims to build the capacity of farmers on climate change and CSA and help them build a network of farmers within the CSVs in the Southeast Asian region. Aside from farmers and experts, local officials, non-government organizations, and extensions workers join the roving workshops.
- The first roving workshop was organized in the Philippines and was attended by 18 participants, six of which were farmers; the 2nd workshop in Vietnam with 28 farmers, 22 of which were farmers; the 3rd in Cambodia with 22 farmers joining eight more participants; and the 4th and latest in Lao PDR, with 33 farmers and 27 non-farmers. CCAFS were able to increase the number of participants in the succeeding workshops.
- Several international institutions also joined the workshops: CABI, CARE International, and CUSO International. The agricultural research offices (Philippine Rice Research Institute, NOMAFSI, Vietnam Academy of Agricultural Sciences, and the National Agriculture and Forestry Research Institute) of the host countries also joined.
- A total of 24 practices (two on soil; nine on crops; three on water; five on livestock; two on forestry; two on fisheries; and one on energy) where shared among participating farmers.

Through this activity, a region-wide network was built, which can help in capacitating the farmers on climate change adaptation and mitigation.

P264: Radio broadcasting campaign on CSA in the Philippines

Dr. Rogelio Matalang, Philippine Federation of Rural Broadcasters

- *Climate Change: iBroadkas Mo!* is a pilot radio campaign in the Philippines, which tackles climate change. It aims to educate rural broadcasters on climate change and its related issues for them to communicate relevant information to their captive audience. Through this campaign, the broadcasters were also taught how to effectively communicate climate change through the radio, highlighted by short but attractive messages that easily capture the attention of listeners.
- During the Phase 1 of the campaign, 153 rural broadcasters in Luzon, Visayas, and Mindanao were tapped to join the campaign. These broadcasters cover a total of 90 radio stations with an estimated audience of two million listeners. They received ready-to-be-aired (RTBA) materials that they included in their respective radio programs. The materials were written and aired in four languages: *Tagalog, Ilocano, Cebuano*, and *Bisaya/Waray*.
- The implementing partners include the Philippine Atmospheric, Geophysical and Astronomical Services Administration, the Agricultural Training Institute, local government units, state universities and colleges, and local climate change centers. CCAFS SEA served as the funding partner of the project while the Department of Agriculture spearheaded the implementation.
- For Phase 2, three broadcast production workshops were organized to develop a new set of RTBA materials for the broadcasters. The materials will again be written and aired in diverse languages to reach a broader mass of audience.

P264: The radio-based distance learning (school-on-the-air) on CS rice production

Hector Tabbun, Regional Information Officer, Department of Agriculture Regional Field Office 2

- The school-on-the-air (SOA) is also known as a "university without walls" because it transcends spatial barriers in learning. The SOA, which aired through the radio, served as an educational and discussion platform where farmers can easily reach experts whenever they have queries on their farming activities. The SOA program also facilitated the delivery of government services complemented with resources from the public and private sectors.
- The Department of Agriculture collaborated with other government offices and partners to ensure successful implementation of SOA. Logistical matters were also addressed in behalf of the farmers for them to easily learn from the program. The episodes of the SOA program adopted an "edutainment" approach, i.e., the messages are not only educating, but also entertaining. This is to keep the attention of the audience, who only relies on their sense of hearing to learn from this program.
- Through the SOA program, farmers learned CSA on rice production, emphasizing value chain. The program also pulled relevant actors together to provide support services for the farmers.

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This strengthened the partnership between the private and public sectors and between end-users and experts. In the end, several outcomes emerged from the program, including resilient people and villages, productive farms, and enough rice supply.

- For the future activities of the program, an impact assessment will be conducted to assess the effectiveness of the SOA. Farmers were also heard through the feedback mechanisms of the program. They said they are proposing for another round of the SOA, which they hope will tackle other commodities and will be aired in another time within their planting schedules.

P264: StartUp Project for Climate-Smart Villages: Platforms to Scaling Out Climate-Smart Agriculture and Community-Based Adaptation in Myanmar

Wilson John Barbon, IIRR Myanmar

- Myanmar has a capital for its business ventures in Yangon and for its government processes in Naypyidaw. Its population, which already reached 53 million citizens, is highly dependent to agriculture. In fact, agriculture contributes 34% to the country's gross domestic product. The 75% of the rural population of Myanmar depends on farming. However, only 13% of the farms is irrigated.
- Unlike other countries in the region, Myanmar has three seasons: rainy; winter; and summer. Due to climate change, the following observations were recorded: increasing temperatures characterized by fewer cold days and frequent hot days, earlier start of monsoons, and shorter rainfall durations. In this regard, CCAFS, IIRR, and their partners helped the government of Myanmar craft its Climate-smart Agriculture strategy.
- The target impact of the project is "resilience in agriculture, food security, and nutrition," which will be anchored on CSA options and the Community-based Adaptation (CBA) approach. The CBA aims to understand vulnerabilities and drivers of nutrition and food security; test innovative technologies and methodologies; and apply social learning methods to establish evidences on the effectives of climate actions.
- The key outputs of this project include a scoping study on four agro-ecological sites, baselines studies, publications, farm-level testing of CSA options, homesteads, and school-level testing. From these outputs, the following outcomes had emerged: initial linkages between CSA initiatives in CSVs and government research; strengthening of the National CSA Center at the Yezin Agricultural University; and civil society participation.
- Future activities include the conduct of an action research that will tackle gender and nutrition in CSVs, and piloting of technologies based on the results of the baseline studies. A training course on national-level CSA and CSV implementation will be organized in 2019, as well as a national and regional conference about those topics. These will be reported in future publications such as primers on integrating the aspect of nutrition into CSA options and working papers on evidence base for CSVs as platforms for CBA, nutrition and gender, and pathways to scale CSA and CBA in Myanmar.

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Discussion on Breakout Session 2

- The main difference of pest-smart practices to integrated pest management (IPM) lies on the context. Pest-smart practices are contextualized on climate change conditions. Specifically, such practices focus more on anticipating P&D outbreaks and uncertainties. After all, climate change can be viewed as a problem of "predicting things." Still, the Pest Smart and IPM are almost the same; farmers and other relevant actors must be proactive in implementing either of both.
- For the roving workshop, it was clarified that a core group of participants were indeed selected. This group was able to learn from the different CSV sites in Southeast Asia.
- Ecological engineering was scaled in more than 20 households covering about 9 hectares this 2018.
- CSVs were selected based on location-specific issues. CCAFS recently developed a guide to establish CSVs, which was also displayed during the conference.
- For the radio campaign, implementers were able to retain their listenership through questions-and-answer portions during programs and other incentives such as free mobile phones and radio sets. Retaining the listener's attention was only one of the minor problems since the Department of Agriculture, the lead implementing agency, owns a radio station.

LAUNCHING OF PUBLICATIONS

CCAFS SEA showcased its latest and upcoming publications. These include:

- Compendium of climate-resilient agriculture technologies and practices in the Philippines
    - Authors: Romeo V. Labios, Jocelyn D. Labios, Christine Mae B. Santos, Leocadio S. Sebastian
    - Defines climate change in the Philippine context and listed several climate-resilient technologies and practices applicable in the different types of agricultural land in the Philippines
- 9 steps to CSA scaling from CSVs: Experiences from the climate-smart villages in My Loi, Vietnam and Guinayangan, Philippines
    - Authors: Le Thi Tam, Rene Vidallo, Elisabeth Simelton, Julian Gonsalves
    - Presented ways to scale climate-smart agriculture based on implementation in My Loi and Guinayangan CSVs
- Pest-Smart Practices and Early Warning System under Climate Change: A Manual for Rice and Other Crops
    - Authors: Arnaud Costa, Sathis Sri Thanarajoo, and Sivapragasam Annamalai
    - Contextualizes pest-smart practices under climate change conditions, which helps farmers control and manage the threat of pests and diseases on farms.
- CSA in Viet Nam
    - Authors: Nguyen Tam Ninh, Felicitas Roehrig, Godefroy Grosjean, Tran Dai Nghia, and Vu Thi Mai

- o Defines climate-smart agriculture and presented ways on how to transform the concept into concrete actions that help Viet Nam's agriculture sector thrive under the changing climate.
- Gender Dimensions of Climate Change Research for Agriculture in Southeast Asia
  - o Editors: Thelma Paris, Maria Fay Rola-Ruzben
  - o Compiles case studies that tackle the role of gender in addressing climate change.

CLOSING REMARKS

Dr. Sebastian reiterated that CCAFS projects now aim to generate extensive outcomes. No longer are they after the outputs since they already produced many of them them with their partners. The outcomes, however, do not usually come at the lifeline of projects. He called on the participants to not let go of their projects easily and pinpoint outcomes that they can continue to pursue in the next phase of CCAFS. This can be achieved with an effective monitoring and evaluation framework that would assess the progress of the projects, including the challenges and enabling factors for upscaling, among others.

He also emphasized that CCAFS, being a science-based organization, continues to write journal articles that will be published in refereed journals. Aside from CCAFS, Dr. Sebastian shared that the other CGIAR research programs and centers are striving to publish their work and communicate them effectively to a wider audience to build a quality platform of scalable climate-smart technologies and practices.

Summary of key outputs and emerging outcomes

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Flagship Projects on Climate-Smart Technologies and Practices

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P28: Integrated agricultural technologies for enhanced adaptive capacity and resilient livelihoods in CSVs of Southeast Asia

KEY OUTPUTS

In 2018, the Ma CSV team continued the research on Van Yen, a secondary CSV site, to gather data for four different manuscripts. All of these data sets are supported by the ARE-CCD project, which is funded by the Belgian government for the Vietnam National University of Agriculture (VNUA). The manuscripts tackle the following:

No.	Paper	Data status	Target journal	Impact Factor	Proposed submissions
1	Spatial interpolation methods of determination of digital elevation models for agricultural research	Completed	Catena	3.65	November 2018
2	Digital soil mapping using an 1m interpolated DEM for the study area in northern Vietnam	Completed	Catena	3.65	December 2018
3	Assessment of the effect of grass strips in improving soil fertility and local farmers' livelihoods over different periods of time and management practices in northern Vietnam	Near completion	Catena	3.65	January 2019
4	Assessment of the triple win of intercropped legumes to restored degraded soils, improved cassava yields and dampened population build-up of herbivorous mites on cassava in northern Vietnam	To be completed by January 2019 (after the 2018 cassava season)	Agriculture, Ecosystems and Environment (AGEE)	4.099	April 2019

The team approached the National Target Program on New Rural Development (Nong Thon Moi NTM) implemented by the Ministry of Agriculture and Rural Development (MARD). It was also invited to present the CCAFS FP2.1 work on three different NTM regional and national workshops. These include:

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- a regional workshop on 24 July in Da Nang City;
- a national workshop on 06 August in Vinh Yen City; and
- a regional workshop on 11 October in Yen Bai City.

The team has successfully hosted two cross visits with the Center for Sustainable Rural Development, a Vietnamese NGO, in September and a delegation from Myanmar in November. A farmer delegation from Ma Village and Vinh Kien Commune participated in a roving workshop organized in Cambodia in September.

We wrote three blogs and contributed to one blog post about the CCAFS work in Vietnam, specifically in Ma CSV.

Emerging Outcomes

Farmers in Ma CSV are scaling out CSA options to their village and other neighbouring villages. The scaling is reflected in more than 50 households that already adopted and are practicing various CSA options in Ma CSV.

Nong Thon Moi showed their interest on the CCAFS activities in Ma CSV and proposed to make it as a model to develop a new set of criteria to implement climate-resilient agriculture from 2021-2025. The program tentatively proposed CIAT to collaborate on the work in Northern Vietnam and Central Highlands.

In collaboration with the VNUA, Dr. Bui Le Vinh has jointly developed two Irish Aid-funded proposals based on the CCAFS work in Yen Bai, including:

- Scaling of CSA to Yen Bai Province;
- Research on the low emission potential of the cassava-based conservation practices and a more in-depth study on lab-based mass rearing strong natural enemies for field release in maximally reducing impact of herbivorous mites on cassava; and
- Climate risk mapping for Yen Bai Province.

If funded, the two projects will generate impacts and outcomes based on the CCAFS initiatives in Yen Bai and in the central and provincial NTM implementation from 2021-2025.

Dr. Bui Le Vinh presented the CCAFS FP2.1 work at the regional NTM workshop in Da Nang City on 24 July 2018

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P55: Generating evidence base for upscaling local adaptation through Climate-Smart Agriculture

KEY OUTPUTS

The key outputs that facilitated CSA scaling, which emanated from the Guinayangan & My Loi CSVs are:

1. Eight learning sites (proof-of-concept sites) about the following:
- low external input pig production (Arbismen & Capuluan Tulon in GNY);
- low external input rice production (Danlagan Center in GNY);
- coconut-based understory cropping (Cabong Norte in GNY);
- coconut fruit tree agroforestry (Sta. Cruz in GNY);
- agroforestry in watershed buffer zones (Reserba area in GNY);
- coconut-root crops (Cadig area in GNY); and
- integrated practices (My Loi CSV)

2. Three key social learning approaches to facilitate CSA scaling at local levels:
- 19 farmer learning groups, including 470 farmers who tested CSA practices (through participatory action researches) for three years and assisted in developing learning sites used for scaling in the locality. Such initiatives were adopted by the local government and will be utilized through extension services in the further promotion of CSA;
- At least 30 on-site learning exchanges: Knowledge sharing is provided by 25 farmer leaders from the eight learning sites to improve the skills and capacities of farmer leaders as local CSA knowledge sources and facilitated CSA scaling from at most nine villages in Vietnam and 10 to 54 villages in the Philippines.

3. Two scalable support systems facilitating CSA testing and scaling at local levels:
- Community Innovation Fund (managed by farmer groups and local governments): serves as a kick-start fund to implement CSA; and
- Eight community support facilities (on-site crop propagation and/or animal multiplication centers): allow farmers easy access to new and improved crops, varieties, and breeds.

4. Three major types of upscaling event to promote CSA to scaling partners:
- Off-site events: Workshops, conferences, policy dialgoues, round-table events
- On-site events: training, roving workshops, cross-site visits
- Media coverage

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KEY PUBLICATIONS/DOCUMENTATIONS

	Published	Forthcoming
Journal article	Scaling Climate-smart Agriculture in North-central Vietnam	Bringing climate-smart agriculture towards scale: lessons learned from Southeast Asian climate-smart villages Gender considerations in CSV development
Info note	Portfolio of My Loi CSA practices for scaling; Creating Wealth from Waste: Resource Use Efficiency in Climate-Smart Agriculture	Potential role of CSA for addressing gender equity issues; Social learning in CSA; Portfolios of CSA technologies & practices tested & promoted in Guinayangan CSV
WP	Climate-induced vulnerabilities: Participatory assessment for My Loi Village, Ky Son Commune, Ky Anh District, Ha Tinh Province; Situation Analysis and Needs Assessment Report: My Loi CSV; Roles of Social Learning for the Adoption of Climate-Smart Agriculture Innovations Case study from My Loi Climate-Smart	Impact Areas as platforms for scaling out Role of Community Innovations Fund for CSA scaling
Guide	Community Innovations Fund Implementation Process: My Loi experience; Vermiculture; Tastes of Agroforestry	Guideline for implementing and scaling CSA; Impact areas as platforms for scaling out
Primer	CSA through Farmers Voice; Climate Change and CSA for local governments	

KEY OUTCOMES

- **Uptake at sub-national level through local partners' policies and programs**
  - Guinayangan LGU: 2019-2020 MAO Programs on livestock (+ forage gardens and native pigs), rice (+ seed bank and SRI), coffee and cacao (+ fertilizer trees), corn and HYV (+ intercropping and organic practices), seasonal planning and advisory, municipal CSA demo site in the Philippines amounting to PHP 5 million worth of extension services.
  - Ha Tinh, VN: Five-year action plan for the Ha Tinh Provincial FU and Ky Anh FU; New Rural Development (NRD) Plan for the DARD office of Ky Anh District; Socio-economic Development Plan and NRD plan for Ky Son Commune

- **Farmers benefiting from CSA promotion & sub-national-level scaling**
  - Integrating CSA into the:
    - commune's extension services/plans, which are expected to benefit 2,000 farmers in nine villages.

- five-year activity plan of Ha Tinh Province and Ky Anh District Farmer Union, which is expected to benefit 238,500 farmers in Ha Tinh province
    - Planned scaling (IIRR & LGU-led): CSA options distributed from about 300 CCAFS beneficiaries to 500 secondary beneficiaries, and 1,000 more outreach farmers. CSA uptake in LGU plans and programs is expected to benefit 5,000 farmers in 54 villages.
    - Guinayangan LGU + STIARC (NARES): PHP three-million project to scale out low external pig production with market linkage in Guinayangan CSV; LGU and farmers' support to the development of DA IV-A AMIA Village in San Francisco, Quezon; Promote CSA to one more municipality and around 200 farmers within project cycle.
    - Guinayangan LGU + 10 neighbouring LGUs: interest in replicating CSA-focused interventions is projected to reach around 50,000 farmers.
- **CSA uptake at national levels**
    - IIRR training of 17 DA RFOs and LGU partners under the AMIA Program. This training contributes to the development of AMIA villages.
- **CSA uptake at partner NGOs/ institutions**
    - Caritas projects in Panay Island, Philippines (4 provinces, about 1,000 farmers)
    - On-going: SRD/ NAP-CORE3 project; CIAT and IFAD/ SRDP- FoodStart+ project (ongoing)
    - Under development: GIZ/SIPA; SOCODEVI/Pomelo AF cooperative
- **Gender evidence:**
    - joint involvement of husband and wife
    - Mixing of gender groups autonomously
    - Change interest of CSA practices of women from intercropping to agroforestry
    - Both men and women can facilitate or present group results in larger farmer groups
    - Household asset-building from specific CSA practices: low external input pig production practices (basis of STIARC-LGU project in GNY)

FUTURE ACTIVITIES
- Philippines:
    - Develop district-wide CSA promotion project (10 municipalities in Quezon Province), targeting around 50,000 farmers
    - Follow up on capacity building programs for 17 DA RFOs implementing AMIA program.

- Vietnam:
    - Implement a gender project in Ha Tinh: Gender-Platform/Changing gender roles and implications for scalable gender inclusive climate resilient agriculture technology
    - SIPA project funded by GIZ (under-development)
    - Develop a CSA text book with the Vietnam National University of Agriculture
    - Follow up with annual plans of CSOs and extension in Ha Tinh Province

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P54: CSVs in the Mekong Basin: Defining an Innovative and Comprehensive Approach for Catalysing Roll-out of Large-scale Adoption

The overall objective of this project is to elevate the CSV concept from mere benchmarking to a standardized approach to increase adaptive capacities of actors from village to province and

national scale. As the underlying principle, the project introduces innovations as integral part of local farming systems and not as stand-alone component technologies.

Ekxang CSV:

Our approach integrates site-specific solutions for home-based vegetable production into a generic tool that can be applied across the villages in the greater Mekong Region. Accordingly, key factors influencing irrigation efficiency and cost-effectiveness of on-farm water management were identified with farmers. A range of agro-hydro systems were accounted by extending the work in Ban Ekxang to other villages in Laos and Myanmar. An optimization model was calibrated with field data to design a rainwater harvesting system that both minimizes investment costs and the risk of water shortage. Several scenarios identified by farmers were simulated to demonstrate the potential of the tool.

Phailom CSV:

The CSV work in Phailom and in Savannakhet Province has focused on community-based rice seed systems. The approach encompasses initial information and training events such as seed fairs and Farmer Field Schools, as well as the establishment of a seed bank. This work is done in close collaboration with Cuso International, a Canadian NGO that assigned one International Volunteer in Savannakhet. The project group has forged strategic alliances and a new collaboration with the project implemented by FAO and IUCN, which addresses wetland restoration in the vicinity of Phailom CSV. The project team also conducted a photovoice activity in Phailom, which was documented through a video. This video showcases the positive perception of farmers on improved seed systems, which will be shown during stakeholder meetings in various levels. The project also engages with the Savannakhet University to conduct a study program on different topics of CSA implementation in Phailom.

Rohal Suong CSV:

Rohal Suong CSV mainly focuses on the participatory approaches to CSA prioritization and planning. This project is working with both government departments and NGOs, including the Department of Agricultural Extension under the Ministry of Agriculture, Forestry, and Fisheries, Provincial Department of Agriculture, IRRI, CABI, and AS. Through the pilot testing of CSA Technologies and Practices (CSA T&P), several farmers in the CSV and neighbouring villages adopted specific T&P, including ecological engineering, stress-tolerant rice varieties, plant clinic, and agroforestry. The key lessons learned from introducing the CSV approach and CSA practices were documented and shared with various practitioners and key stakeholders at sub-national and national levels through study tours and external workshop presentations. Decision makers at the district and provincial levels recognize the value of the CSV approach, and selected Rohal Suong as a demonstration site under the IFAD-funded ASPIRE Project, which is worth USD 50 million.

KEY PUBLICATIONS:

- Dyna E., Emdin F., and Kura Y. 2018. Towards Effective Participatory Decision-Making on Climate-Smart Agriculture (CSA) Technologies: A Case Study of Rohal Suong Climate-Smart Village, Battambang Province, Cambodia. CCAFS Working Paper No. 241. Wageningen, the

Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Available online at: www.ccafs.cgiar.org

- Climate-smart agriculture improves farmers' incomes and climate change adaptation capacity: https://ccafs.cgiar.org/blog/climate-smart-agriculture-improves-farmers%E2%80%99-incomes-and-climate-change-adaptation-capacity#.W9LdaDExWBY
- Scaling ecological engineering in Cambodia: https://ccafs.cgiar.org/blog/scaling-ecological-engineering-cambodia#.W9LdQTExWBY
- Developing pest-smart farmers in Cambodia: https://ccafs.cgiar.org/blog/developing-pest-smart-farmers-cambodia#.W9Lc4jExWBY

Tra Hat CSV:

The focus in Tra Hat was to engage stakeholders to select promising combinations of CSA practices. In cooperation with Can Tho University, the project organized a workshop in Bac Lieu Province to demonstrate the feasibility of mushroom cultivation based on rice straw, as opposed to straw burning. Our approach of establishing mushroom production based on rice straw is an activity preferably for women. Our CSV work was also contributing to a broader scaling approach of the Sustainable Rice Platform that is promoting sustainability standards in Vietnam and other rice-growing countries. We also conducted a gender impact analysis of CSA practices.

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Flagship Projects on Low Emissions Development and Climate Information Services and Climate-informed Safety Nets

P21: Assessing incentives for scaling up mitigation at different stakeholder levels: 'No-regret' mitigation strategies in rice production and the Climate and Clean Air Coalition (CCAC)

Since its inception in 2014, the P21 project has shown notable progress. The journey from research to impacts has been steadily manifesting in concrete and tangible outcomes.

Mainstreaming of low emission development technologies gets investment boost in Thailand

In implementing this project, significant effort has been devoted in filling the knowledge gaps around mitigation options in rice, particularly the alternate wetting and drying (AWD) technology and understanding the incentives/disincentives for farmer adoption of low emission development (LED) technologies. Also, the project seeks to understand the synergies between modernization/mechanization and mitigation.

Initial learnings were integrated into a proposal on Thai Rice Nationally Appropriate Mitigation Action (NAMA), which was jointly developed by the consortium comprising the Thai Rice Department, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), International Rice Research Institute (IRRI), Sustainable Rice Platform (SRP) and other public and private partners and was funded by the NAMA Facility. Recognizing the merits of the Thai Rice NAMA proposal, the NAMA Facility has approved its implementation last June 2018. The 15mio EUR five-year project will focus on low emission production, mitigation services, and policy formulation and supporting measures. This will be implemented mainly by the Thai Rice Department under the Ministry of Agriculture and Cooperatives and the Ministry of Natural Resources and Environment and aims to reach 100,000 farmers in six provinces in Thailand. The project is expected to contribute to greenhouse gas (GHG) reduction of about 1 million tons of CO2eq.

The project builds on IRRI/CCAFS science and includes different LED technologies for rice such as AWD and laser land levelling. The project will focus on: (1) innovative technologies, management options, and farmer business models for rice straw management; (2) carbon footprint analysis of alternative rice straw management against a baseline of GHG emissions from straw burning; (3) carbonization of straw (biochar) as a pioneering approach for lowering the footprint and increasing income; (4) methodologies for and results from sustainability assessment for promising rice straw management options; and (5) communication and outreach strategies to disseminate the results.

Concerted action for climate change mitigation in Asia's rice-based systems

Majority of the countries in Asia are major rice producers and consumers. To meet the world's growing demand for rice, rice production needs to improve significantly in a sustainable and environmentally-sound manner.

To address these concerns, the UN Environment Programme and the Food and Agriculture Organization of the United Nations (FAO), in partnership with the World Business Council for

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Sustainable Development (WBCSD), GIZ, IRRI and the SRP, proposed a major initiative on **Inclusive and Sustainable Rice Landscapes** under the GEF 7 Impact Program: "Food Systems, Land-use and Restoration".

This initiative, which builds on the work of the SRP—convened by UN Environment and IRRI—will focus on rice production landscapes in targeted countries towards sustainable generation of food, ecosystem services, and global environmental benefits. IRRI, through this project, actively contributes initial outputs like suitability maps (Vietnam and the Philippines), regional GHG analyses, and socio-economic studies.

Emerging Outcomes

- A Letter of Agreement has been signed with the National Agricultural Extension Center (NAEC) for the co-development of training materials that would cover climate-smart practices and integrate low-emissions options into standard crop management recommendations. The materials will focus initially on the agro-environmental context of the Mekong Delta, and would potentially shift to the Red River Delta.

- The development of national emission factors (EFs) for rice in Vietnam is forthcoming. EFs are important in planning for mitigation strategies more effectively. Dr. Mai Van Trinh of The Ministry of Agriculture and Rural Development-Institute for Agricultural Environment is leading this national effort, with the IRRI-CCAFS results to be integrated in the process.

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Bilateral: Development of LED investment plan for rice

LED interventions are important to the Nationally Determined Contributions (NDCs) of developing countries. In Vietnam, rice is the most important crop and accounted for the huge amount of agricultural GDP. It emitted a large amount of greenhouse gases (GHGs) (about 88.36 million tons of carbon dioxide equivalent [MtCO2e], which accounted for 33.2% total national GHG emission in 2010). However, rice production has also significantly contributed into NDCs through LED interventions.

Supported by CCAFS, USAID aims to support the NDCs using LED interventions, develop a plan for domestic investment, and identify the most promising sources of international finance for LED interventions of alternative wet and dry (AWD) and mid-season drainage (MSD) from rice cultivation. Several methodologies have been applied to achieve the objectives, including policy gap analysis, PRA, bottleneck analysis, SWOT, CBA and marginal abatement cost curve (MACC).

The results found that there are plenty of relevant policies to support GHG emissions reduction. These results, however, are not clear on the financial sources. Some of them present ambitious targets despite limited supportive sources. AWD and MSD are not specified as priorities in the regional level despite the support of policy makers on LED interventions.

The study showed that AWD is one of the important technical solutions in the NDC implementation plan, which possesses a high potential for GHG emission reduction and shows higher returns from 9.43% to 22.91% (equivalent to 2.16 to 5.67 million VND/ha as compared to conventional rice cultivation).

The study also developed the plan to invest on AWD and recommended that governments must improve institutions and policies; capacities of policy-makers, private sector partners and farmers; national capacity on NDC implementation in relation to AWD in rice production; coordination and collaboration mechanisms for AWD in rice production to exploit domestic financial sources (through action plans in responding to climate change; sectoral and national GHG emission reduction project; agricultural restructuring project; national targeted program on building new rural areas, sources of investment for socio-economic development; and investment support sources from enterprises and private partners); and strengthen partnership with international finance sources (GEF, IKI, NAMAs, international financing banks, and bilateral cooperation with governments).

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Sustainable intensification of dairy production in Indonesia

Indonesia has committed to reduce national GHG emissions by 29-41% compared to business-as-usual scenarios by 2030 (NDC, 2016). Dairy farming contributes to climate change via emissions of methane (CH_4), nitrous oxide (N_2O) and carbon dioxide (CO_2). Recent research in West Java showed that the major sources of GHG emissions from dairy production systems were rumen enteric fermentation, manure management and off-farm feed production (De Vries et al., 2017). A scenario analysis showed that improved feeding and manure management practices have the potential to reduce emissions per kilogram of milk up to at least 14% if measures are combined.

The aim of the SIDPI project (Sustainable Intensification of Dairy Production in Indonesia; 2016-2019) is to sustainably increase farm productivity and farmer incomes while reducing GHG emissions of small-scale dairy farms in West-Java. SIDPI is a collaboration between Wageningen Livestock Research (WLR), Bogor Agricultural University (IPB), dairy cooperative KPSBU West-Java, Frisian Flag Indonesia (FFI), and Trouw Nutrition Indonesia (TNI). In 2016-2017, the project identified various LED options, notably:

- Improved recycling of cattle manure as a fertilizer by: (i) applying manure to land for fodder production, (ii) selling cattle manure to horticulture and flower business;
- Improved animal nutrition by (i) improving rations and feeding practices, (ii) fodder conservation, (iii) introduction of new forages, and (iv) mineral supplementation.

In 2017-2018 the feasibility of LED options was tested under practical conditions in 18 pilot farms. Key outputs for 2018 are:

- Report (in preparation) and MSc theses describing case studies of effects of LED options on productivity, resource efficiency, and GHG emissions;
- Training material for farmers and extension workers (5 trainings): composting (IPB), fodder production (IPB), silage making (IPB/WLR), improved feeding (WLR), and mineral supplementation (TNI);
- A new technology for small-scale composting by farmers with limited room in the barn;
- Scientific publication (in prep.): 'Economic value of manure as a fertilizer: an evaluation of manure management options in West-Java, Indonesia;
- Scientific publication (submitted): 'Entry Points for Reduction of Greenhouse Gas Emissions in Small-Scale Dairy Farms: Looking beyond Milk Yield Increase'.

More outputs are expected, including practice guidelines for improved feeding and manure management, business investment cases, a policy brief, and eight publications of PhD students. In addition, results will be shared with potential next-users, specifically in a high-level meeting with the national and provincial government, training of extension workers of other dairy coops in West-Java (around 57K farmers), and a SEA regional workshop.

In terms of emerging outcomes, the dairy cooperative KPSBU in Lembang (4k farmers) has started to monitor discharging of cattle manure and is expected to start a revolving fund for manure management investments in 2019 with support of the SIDPI project. If possible, the National Government (MoA) and the provincial government of West Java will be advised on solutions for dairy waste management, as well as dairy cooperatives in Java (190k dairy farmers). This initiative will be linked to the Indonesian Citarum Harum Program (a program to clean the Citarum river in West Java, which is supported by IMF and ADB).

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P48: Enhancing adaptive capacity of women and ethnic minority smallholder farmers through improved agro-climate information in Southeast Asia

The ACIS project looks at how to strengthen the value chain through a two-pronged approach: supply forecast information that meets users' demand (top down), translate into agro-advisories by integrating local knowledge and ensure feedback mechanisms that lead to adaptive learning (bottom-up).

ACIS was implemented by ICRAF and CARE from 2015-2018 in Vietnam, Laos and Cambodia in five project sites and in nine different ethnic minority groups. The project was funded by CCAFS with bilateral funds from Foundation Ensemble and CARE Denmark.

KEY IMPACTS:
- Actionable agro-advices helped with planning and resource use efficiency
  - Reduced yield variability. Better timing contributed to a comparatively smaller decline in cassava yields. Farmers with tree-based systems were less affected by extreme weather events and recovered economically faster than those with monocultures.
  - Improved resource use efficiency. Farmers used less pesticides as they paid more attention to the forecasts before management decisions. This saves time and money and has environmental benefits.
- Participatory agro-advice contributes to community learning and resilience
  - Strong evidence of social learning, gender impacts and their values. Farmers ranked community learning among the top three impacts of the ACIS project (Simelton et al., 2018b). Three years into the project, both women and men actively participated in planning workshops; women took roles as facilitators also in mixed gender groups. Automatic weather stations can very well be farmer-managed.
  - Gender benefits. Where advisories are discussed in interest or saving groups, women gained more influence in agriculture decisions both at home and in the community.

KEY LESSONS LEARNED:
- Ask users what information they need and let them co-design the product. Participatory Scenario Planning meetings enable testing and developing of new and modified products and getting the feedback from different user groups (Le et al., 2018). The meetings can be

incorporated into other community development activities, such as savings and loans activities, farmer field schools, rural development programs and peer-to-peer scaled out to neighbour villages.

- Improve access to, and quality of weather forecasts. Comparing different forecast sources with observations highlighted the variability of forecasts and may help finding one that is correct more often or systematically over/underpredicting (Roy et al., 2017). Agro-ecological zoning helped local planners exploring options for crop feasibility and alternative land uses. This project showed that automatic weather stations can be farmer-managed.
- Build in community adaption. Having farmer champions translating the forecast into agro-advisories meant that they understood the content, made climate services publicly available and adapted the advice to local needs. Farmers are empowered if they know where to ask for information and take preventive measures.

POLICY RECOMMENDATIONS:

The government aims to enable proactive adaptation measures.

- Governments need evidence for how long-term planning and short-term adaptation interventions can prevent loss and damage. Community agro-climate information can thus be costed as adaptation benefits in investment plans and contribute to national commitments to Sustainable Development Goals, National Adaptation Plans and the Paris Agreement. This opens investment opportunities for co-funding via Green Climate Fund, Global Environment Facilities, the World Meteorological Organization's Global Framework for Climate Services.
- Align agro-climate information and recommendations with resilient farming practices, including CSA, agroforestry and mixed farming systems, and low emission strategies. Actionable agro-advisories imply preparedness for uncertainty and risks by identifying available no-regret adaptation options.
- Removing financial obstructions for sharing meteorological data across line ministries will make climate information more timely, accessible, and useful.
- Invest in closing information and capacity gaps between national and subnational levels.
  - Support participatory learning and sharing platforms for producers, translators, and users of agro-climate information from the sub-national to village levels. Appropriately include the needs, local knowledge and feedback from women and men farmers, who are the end users of forecasts and agro-climate bulletins. This builds local learning processes and capacity to understand, interpret, and act on agro-climate information.
  - Develop agro-climate information with users and disseminate using multiple media and tools that is available for a range of literacy, language, and technical skills. Be open to incorporate other types of information that influence farmers' decision, such as market prices, insurance and policy support. Consider farmer-to-farmer networks, social media, and call centers.
  - Invest in improved accuracy of forecasts and down-scaling procedures and upgrading and/or establishing a denser network of automatic weather stations, coupled with the use of remote sensing information.
  - National investment plans for education should target university programs and short training courses for local agriculture extension staff on agro-meteorology to strengthen local capacity to respond to local demands of weather information.
    - Prioritise capacity building of subnational staff involved in producing, interpreting, and translating weather forecasts into agricultural advice, risk and planning.

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Regional projects

P264: Challenges and opportunities for creating a climate-smart food system in the Philippines and Vietnam

In many developing countries in Asia, food systems fail to deliver access to high-quality food. This is likely to worsen with additional pressure and vulnerability being infused on those systems by climate change and weather variability. This study examines various elements of food production, consumption, processing, and distribution systems, in addition to institutions, policies, and markets in selected provinces of the Philippines and Vietnam to identify challenges and opportunities for a sustainable and climate-smart food system. This includes how the item is grown, how it is handled, how value is added, how it is transported, how the food is purchased, and how it is influenced by changing consumer behaviours.
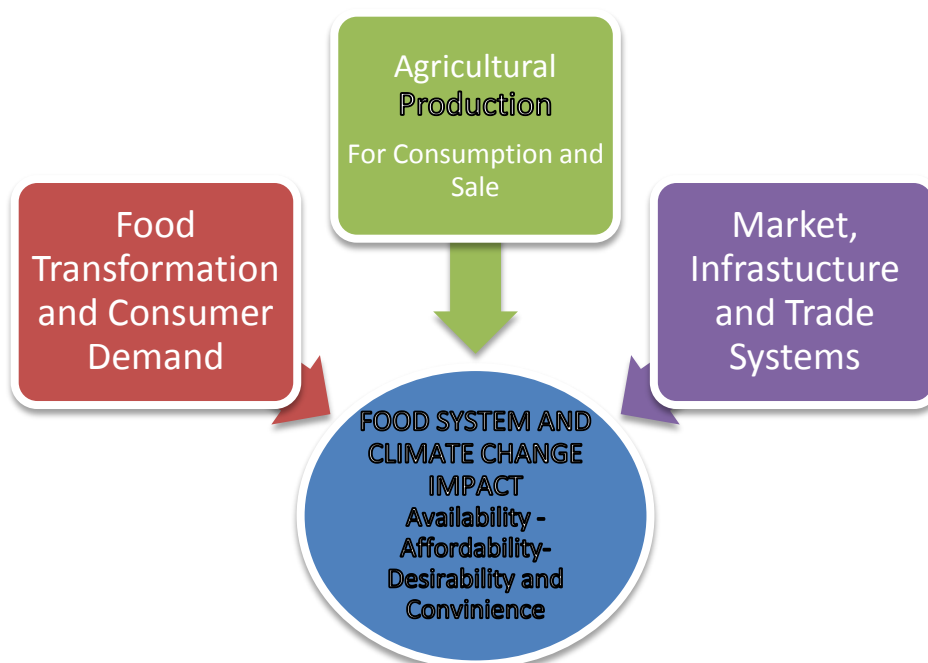
Conceptual Framework Linking Food Systems to Climate Change: Adapted from Frameworks for Food Systems Analyses Promoted by the Global Panel on Agriculture and Food Systems for Nutrition[1]

Using the framework presented in figure 1, the following questions surface and guide the interest of this study:

1. What are the challenges and opportunities for creating climate-smart food systems in the Philippines and Vietnam?

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[1] https://www.glopan.org/sites/default/files/FoodEnvironmentsBrief.pdf

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a) How have urban and rural diets changed in climate change/variability affected areas of the Philippines and Vietnam?
b) To what extent have current production system contributed to negative environmental effects?
c) What are the constraints and opportunities for climate-smart food systems along the value chains for (1) cereals, (2) animal sourced products, and (3) roots and tubers?

Selection of the Research Site and Data Collection

The selected regions in the Philippines are: Tarlac and Nueva Ecija in Central Luzon and Leyte and Samar in the Visayas region. The selected regions in Vietnam are Bac Ninh and Thai Binh in the northern region and Tra Vinh and Bac Lieu from the Mekong Delta region.

We have collected provincial level secondary data and national representative household survey data to analyze the changing consumption and expenditure patterns of households in urban and rural areas affected by climate change and vulnerability and climate-smartness of production system at the provincial level. This is supplemented through focus group discussions (FGDs) and key informant interviews (KIIs) with value chain actors at the provincial level to identify constraints and opportunities for climate-smart and sustainable food systems along the value chain.

For example, in Tarlac Province in Central Luzon, we selected rice, maize, and sweet potato for in-depth analysis. Table 1 shows the key value chain actors for these three commodities in the province. Three FGDs were conducted in three different municipalities of the province: Moncada, Conception and Gerona. In-depth KIIs were conducted for other value chain actors of rice, sweet potato, and maize across eight municipalities of the province (Tralac City, Moncada, Conception, Pura, Paniqui, Mayantoc and Gerona) and in a wholesale market outside the province—at *Divisoria* in Manila.

Commodity value chain for rice, maize and sweet potato in Tarlac province, Philippines

Commodity		Value chain actors			
1. Rice		Individual Trader/ Cooperative Trader and Miller	Miller	Wholesaler	Retailer
2. Maize	Fresh Green Cob	Trader	Wholesaler	Retailer	Processor
	Shelled Yellow Grain	Trader	Feed Miller		
3.Sweet Potato	Fresh Root	Trader	Wholesaler	Retailer	
	Sweet Potato for processing	Trader	Feed Miller		

Commodity value chain for rice and potato in the Bac Ninh province, Vietnam

Commodity	Value chain actors					
1. Rice	Farmer	Collector/Processor	Wholesaler	Retailer	Consumer	
				Exporter		
2. Potato	Potato for sale	Farmer	Collector	Wholesaler	Retailer	Consumer
	Potato for seed	Farmer				

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P264: The Asia Climate Policy Hub: Developments and strategy in Southeast Asia

The Asia Climate Policy Hub has implemented a range of activities in 2018 to support the development of climate policies in agriculture and the preparation of CSA investment plans.

In the Philippines, the Climate Policy Hub has been working closely with the Department of Agriculture and FAO. Climate Risks Profiles are being finalized for nine key value chains in the three island groups of the country. They identify key climate risks along these value chains and entry points for adaptation interventions. Climate Risks Profiles and additional economic analysis will support the implementation of the Climate-Resilient Villages in 16 regions of the country and will feed into a GCF proposal to scale Climate-Resilient Agriculture and Climate Services.

This 2018, the CPH continued its engagement on CSA, working with FAO and the World Bank and national partners to prepare CSA profiles for five new countries in Southeast Asia (Cambodia, Laos, Myanmar and Thailand) and Central Asia (Kyrgyzstan). In Pakistan, provincial profiles for Punjab and Sindh are also being prepared. These profiles will be finalized in 2019 and contribute to inform policy processes on CSA.

In Vietnam, several studies were finalized to review Vietnam's NDC. These studies that involved CCAFS and several CGIAR centers provide technical input to the on-going Talanoa Dialogue, where countries are expected to update and revise their NDC. Likewise, in Bangladesh, we have finalized a Climate-Smart Investment Plan with the World Bank, IIASA, and other partners. The plan helps in prioritizing CSA interventions for the country by quantifying their long-term impacts with respect to multiple objectives related to the implementation of the Paris Agreement and the Sustainable Development Goals. It assesses the impact of CSA packages on food security, water use, profitability of the agriculture sector under various scenarios.

CIAT has launched a new strategic initiative, led by the Climate Policy Hub in Asia, on Agricultural Risks Management to better support de-risking agricultural investments. This initiative will work closely with credit and insurance providers, and extension services, among others, to design new bundled financial products that facilitate the uptake of CSA. A new project financed by BMZ will start in 2019 in the Philippines with key institutions (PCIC and ACPC) to design improved financial products for farmers.

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P264: Adaptation Options for Rice-Based Cropping Systems in Climate Risk-Prone Provinces in the Mekong River Delta

Consultation meetings and field visits were organized by the Department of Crop Production and the CGIAR Research Program on Climate Change, Agriculture and Food Security in Southeast Asia with the Department of Agriculture and Rural Development offices in the five selected provinces in the Mekong River Delta. The five provinces visited for the consultation meetings were Long An, Tra Vinh, Dong Thap, An Giang, and Can Tho.

The consultation meetings focused on (1) the progress of the rice area transformation based on MARD Circular no.19/2016/TT-BNNPTNT; (2) the climate-related risk maps and adaptation plans of the provinces; and (3) the possible options for each risk areas under different scenarios. Complementary data on cropping calendar, crop production practices in the monsoon and summer seasons, constraints to crop production and post-production, and capacity development needs were also included in the meetings.

From the field visits, local officials identified several issues that hamper effective agricultural transformation in the region. Among the issues identified include the failure to consider risks brought by climate change, the unstable and unpredictable prices of agricultural products, the lack of linkages between farmers and their potential markets, and a lack of knowledge and skills to grow new crops. Farmers also tend to change cropping systems spontaneously and not based on the plans provided by the provincial governments.

As a response, the team and the local officials agreed on several recommendations, which include investments to improve infrastructures, financial resources from international organizations, private sector, and public-private partnerships to support agricultural transformation, and provision of relevant agricultural technologies and services.

P264: Assessment of the impacts of climate change on human health and nutrition

Its geographic location and economic situation make the Philippines highly vulnerable to the impacts of climate change and extreme weather events. Such events disrupt food systems, affecting the food security, nutrition, and health of people, especially the most vulnerable groups.

This study aims to assess the effects of exposure to extreme weather conditions, classified as natural disasters, on the proportion of households meeting the recommended energy intake (REI), and the prevalence of stunting and wasting among children under five years old, chronic energy deficiency (CED) among lactating mothers and elderly adults, and nutritionally at-risk pregnant women.

This study utilized cross-sectional data from the 2013 and 2015 National Nutrition Surveys conducted nationwide by the Department of Science and Technology- Food and Nutrition Research Institute (DOST-FNRI). Exposure data came from the National Disaster Risk Reduction Management Council (NDRRMC) for typhoons and floods, the Philippine Rice Information

System (PRISM) of the International Rice Research Institute (IRRI) for drought, and from the Bureau of Agricultural Statistics-Philippine Statistics Authority (BAS-PSA) for *palay* production.

Logistic regression models were adjusted for sex, age, civil status, education, household size, work, and place of work of the household head; ethnicity, illness for the past 2 weeks, availing of pre-natal and mothers class for pregnant women; months of lactation for lactating mothers; hypertension for elderly; food security; membership to Philhealth; participation to 4Ps; place of residence; wealth index; *palay* production; and exposure to climate variables typhoons and floods one month up to six months prior to survey and drought for the first quarter of 2015 and 2016.

Bivariate results showed that socioeconomic status, household size, food security status, sex, age, civil status, belonging to an indigenous group, exposure to typhoons, floods and drought had significant associations with nutrition outcomes. In full models, belonging to the poorest quintile, large and food insecure households increase the odds of stunting and wasting in children 0 to 59 months old, of chronic energy deficiency in elderly adults and lactating mothers and for pregnant women to become nutritionally at-risk.

Households engaged in agriculture were more likely to meet the REI. The effect of exposure to typhoons and floods on meeting the REI at household level was positive at three months but was negative at six months.

Among households in the Mindanao areas, exposure to drought in either the first quarter of 2015 or 2016 only increased the likelihood of children below five years old to become stunted and among elderly adults to become CED. However, elderly adults exposed to drought for both the first quarter of 2015 and the first quarter of 2016 made them less likely to become CED.

The time of exposure to these natural disasters, whether typhoons, floods or drought, appears to affect the outcomes analysed. Cohort data would help to better understand the continuing effects of such exposures. These results provide vital inputs for more strategic responses to climate change adaptation and mitigation programs of the government, particularly for vulnerable population groups.

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P264: Evaluation of institutions, actions and the political economy of responses in Cambodia, Laos, Myanmar, Philippines, and Vietnam, under the World Bank project on assessment of Technical Assistance for Agri-food Resilience to ENSO in East Asia

The 2015-2016 El Niño resulted in substantial losses in agricultural production and income in the Philippines and Vietnam that also impacted the broader economy due to the size of the agricultural sector in employment and national income and downstream that contributes to national and rural employment, household incomes, and linkages to the rest of the economy. Improved preparedness, responsiveness, and investment in resilience can reduce the negative impact of future El Niño events.

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This summary is based on a research study[2] undertaken to raise awareness among policymakers, private sector, and civil society about El Niño Southern Oscillation (ENSO) and its impacts on agri-food systems and offer options to improve preparedness and responsiveness for future events in the Philippines and Vietnam. The 2015-2016 El Niño led to the creation of the El Niño Task Force by the Philippine Government that eventually developed the Roadmap to Address the Impact of El Niño (RAIN). During the same year, the National Center for Hydro-Meteorological Forecasting of Vietnam issued a "Special News on El Niño 2015 and an Assessment of Hydro-Meteorological Trend from September 2015 to February 2016" that officially announced the occurrence of El Niño. Both governments had some successes in responding to this ENSO; Table 1 presents a brief description of the immediate actions undertaken.

One significant achievement in mitigating the impacts of El Niño through the implementation of RAIN by the Philippine Government was ensuring food supply sufficiency and keeping stable food prices. The Government provided production support (advice on land-use and cropping pattern in affected/unaffected areas; irrigation; distribution of seeds in non-vulnerable/mildly-affected provinces) and conducted timely importation to meet short-term needs. The Vietnam Government provided extensive financial support from the central budget for recovery measures from the losses and damages due to ENSO and salinity intrusion in affected provinces. These funds were used for irrigation improvement, (including canal system clearance and pumping stations), hydropower dams, reservoir operation, and enhanced weather forecasting activities.

Despite these successes, there are still areas for improvement in how both Governments address crises like the 2015-2016 El Niño. There was a gap between the Philippine national government and local government units in extending response to the affected areas, leading to problems in disbursing financial and food aid to the most needful areas. Commune leaders likewise need to be more involved in delivering support services by Vietnam government in the affected areas. Other initiatives needed in both countries are capacity strengthening to develop better short-term diagnostics (forecasting, warnings, useful location-specific indication, etc.) and more effective emergency responses when ENSO events are imminent; improved policies and increased investments to build medium- and longer-term preparedness and resilience to better handle future shocks, including research and extension to improve agricultural productivity under shocks (including drought- and salt-tolerant seeds); provision of alternative options especially to farmers (adaptive agriculture practices for extreme farm conditions); and others as shown in Table 2.

Immediate actions undertaken in relation to ENSO 2015-2016, Philippines and Vietnam

	Philippines	Vietnam
1. Government-appointed lead agencies to address El Niño	National Economic and Development Authority (NEDA)	Ministry of Natural Resources and Environment (MONRE) and Ministry of Agriculture and Rural Development (MARD)

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[2] Technical Assistance (TA) for Agri-food Resilience to ENSO in East Asia (P160221) project implemented by the International Food Policy Research Institute with financial support from the Multi-donor Trust Fund of World Bank, 2017-2018.

	Philippines	Vietnam
2. Responsibilities	(i) formulate comprehensive disaster preparedness and rehabilitation plan for El Niño; (ii) assist the public in coping with El Niño; (iii) monitor the implementation of the plan; (iv) conduct large-scale information campaigns to educate the public on ENSO and interventions needed to reduce its adverse impacts; (v) work across government agencies and civil society; and (vi) identify funding sources to implement the activities of the Task Force.	MONRE is the coordinating agency in the formulation and development of legislative measures related to climate change MARD acts as the focal point to carry out or direct activities on natural disaster prevention and control
3. Main plan to implement and objectives	Roadmap to Address the Impact of El Nino (RAIN) intended to alleviate the detrimental impacts of El Niño on food security, energy security, health, and safety	National Target Program to Respond to Climate Change through the Central Steering Committee for Natural Disaster Prevention and Control to organize, direct, and implement prevention, response and recovery efforts brought by natural disasters at the national level
4. Critical interventions to address ENSO	- Water (irrigation) management programs - Food subsidies (food stamps) - Social protection (household assistance)	- Drought-tolerant seed varieties - Irrigation infrastructure - Cash transfers - Export bans

Proposed short-, medium- and long-term responses to address ENSO.

Timeline	Philippines	Vietnam
Short-term responses (1-3 years)	- Solutions to drought impacts on farming and fishery sectors - Distribution of food, seeds and other farm inputs - Cash-for-Work programs - Raising public awareness	- Support for recovery of agriculture production (financial aid: provision of seeds and inputs) - Information and communication strategies on disasters and emergency response - Capacity building (annual training) - Financial support from central budget
Medium and Long-term (4 years and beyond)	- Capacity building (national and local governments; other stakeholders) to develop more resilient communities and	- Enhance forecasting capacity on natural disasters - Outscale climate-smart agricultural technologies

Timeline	Philippines	Vietnam
	reduce loss of life and assets - Address desertification, land degradation, and drought (provision of rainwater harvesting, improvement of existing small-scale irrigation schemes) - Establishment of additional agro-meteorological stations and early warning systems accessible to communities - Disseminate weather information directly to farmers, to improve productivity through better knowledge of when and where to plant crops - Prepare drought vulnerability maps for major crops to assist in prioritizing ENSO responses - Pilot climate-resilient agricultural practices to enhance local resilience - Rural infrastructure investments to link farmers to markets and services	- Analyze community-based maps to identify spatial and temporal viability of groundwater and surface water for better efficiency of water management and exploitation - Risk assessments, hazard and risk mappings - Management of evacuation centers - Monitor and ensure the construction standards for disaster-prone areas in compliance with disaster prevention requirement of respective areas - Develop resettlement plans for population living in most vulnerable areas - Build capacity for local officials, especially those directly involved in disaster prevention and reduction - Raise public awareness on disaster prevention and reduction and emergency response, especially for people living in vulnerable areas

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P264: Development of climate-related risks maps and adaptation plans (CS MAP) for rice production in the Mekong River Delta

Over 1.7 million hectares of land in Mekong River Delta (MRD) of Vietnam are being used to produce 56% of the total domestic rice production and 90% of the country's rice export (GSO, 2016). The MRD is facing the increasing climate-related problems due to impacts of climate change. Annually, high upstream discharge of Mekong River from September to November causes flooding in north-western provinces of the delta. Conversely, low river discharge from January to April causes salinity intrusion in coastal provinces. During the El Niño-Southern Oscillation (ENSO) years, the impacts of flooding or salinity intrusion become more serious causing heavy damage to the autumn-winter or winter-spring rice crop, respectively.

During the ENSO years, the impacts of flooding or salinity intrusion intensified, causing heavy damage to the autumn-winter or winter-spring rice crop, respectively. Severe flooding, drought, and salinity intrusions have occurred in recent years and will be more serious in the future. In recent years, the
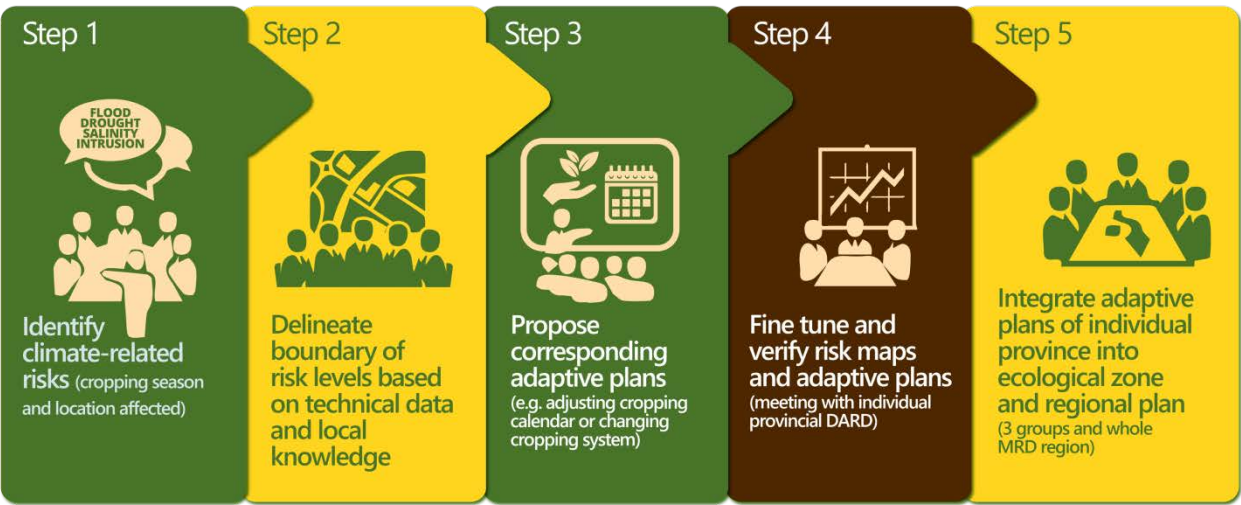
Vietnamese government, together with various international organizations, has improved infrastructure for irrigation, flood control, and water storage and has strengthened the institutions' management capacity and policy development. Despite all of these efforts, the region was still adversely affected during the ENSO event in 2016. An assessment conducted by CGIAR Centers found out that even if warnings were provided by the government for the 2016 ENSO, these were not translated into appropriate preparation and response for agriculture (CGIAR, 2016).

To respond to future climate-related risks, the Department of Crop Production (DCP) of MARD of Vietnam, and CCAFS SEA collaborated to implement the climate-related risks maps and adaptation plans (Climate-Smart MAP/CS MAP) to recognize climate-related risks, identify potentially affected areas, and develop regional and provincial adaptation plans for rice production for the 13 provinces in the Mekong River Delta.

Methodology

The Climate-Smart MAP/CS MAP is implemented following a participatory approach to explore common understanding of risks and integrate local knowledge and research outputs in developing risk maps and adaptive plans. Multi-stakeholders dialogue among experts, officials from the provincial DARD, hydrological and meteorological stations, research institutes, universities, international NGOs and donors is the backbone of the CS MAP. The CS MAP was implemented in five steps (Nguyen Hong Son et. Al, 2018) : (1) Identify climate-related risks, (2) Delineate boundary of risk levels, (3) Propose corresponding adaptive plans, (4) Fine turn and verify risk maps and adaptive plans, and (5) Integrate adaptive plans of individual province into ecological zone and regional plans.

Step 1 — Identify climate-related risks (cropping season and location affected)

Step 2 — Delineate boundary of risk levels based on technical data and local knowledge

Step 3 — Propose corresponding adaptive plans (e.g. adjusting cropping calendar or changing cropping system)

Step 4 — Fine tune and verify risk maps and adaptive plans (meeting with individual provincial DARD)

Step 5 — Integrate adaptive plans of individual province into ecological zone and regional plan (3 groups and whole MRD region)

KEY OUTPUTS

The key outputs of the CS MAP methodology were first piloted in Bac Lieu Province and then implemented in all the 13 provinces of MRD. The first multi-stakeholders dialogue was organized for 130 participants from 13 provincial DARDs, DCP, eight national research institutes, two hydro-meteorological centers, and international organizations. In terms of the results, scientific, technical, local knowledge, and historical and projected climate information were integrated into a map that delineates levels of risks and potentially affected areas to flooding and salinity intrusion. Two risk

scenarios based on intensity and duration of hazards were also developed. Changing rice-based cropping systems and sowing/transplanting calendars were common adaptive measures proposed by the provinces. Follow-up consultation meetings were then held in individual provinces to fine-tune CS MAP outputs with local officials. Up to mid-2018, risk maps for flooding, drought, and salinity intrusion and corresponding monthly adaptive cropping schedule of whole MRD, both for normal and severe years, were completed.

Emerging outcomes

The implementation of CS MAP was accepted wholeheartedly by DCP and the provincial DARD leaders in MRD. It was used in developing short-, medium-, and long-term land use plans of the provinces. On 20 July 2018, the proposed planting calendar has been approved and launched by the Vice Minister of Agriculture and Rural Development. To implement hte outputs of the CS MAP, the Vice Minister assigned DCP to work with concerned DARD offices to implement the recommended crop calendar as part of the VNSAT (Vietnam Sustainable Agricultural Transformation) project activities. This conclusion was officially issued by MARD per the announcement No. 6194/TB-BNN-VP.

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P264: Preliminary Estimates of Large Ruminant Enteric Methane Emissions in Northern Vietnam

Agriculture provides food security, employment and income for more than two thirds of Vietnam's population, particularly the rural poor. However, agriculture is both challenged by climate change and is responsible for high levels of GHG emissions, in which livestock is second only to rice production in importance. It is estimated that two species, cattle and buffalo, account for approximately 90% of total livestock emissions, but this is not well characterised, as these estimates are derived from census data and the use of default (IPCC Tier I) emission factors. MARD developed an action plan to respond to challenges on climate change but is hampered by a lack of current and accurate information, especially with respect to current emissions from ruminant livestock. The Institute of Agricultural Environment (IAE) was asked by MARD to review and possibly revise agricultural emission sources in Vietnam. Because the IAE currently lacks the resources to produce revised livestock GHG emissions estimates, ILRI provided the methodological framework and sampling capabilities to fulfill this task.
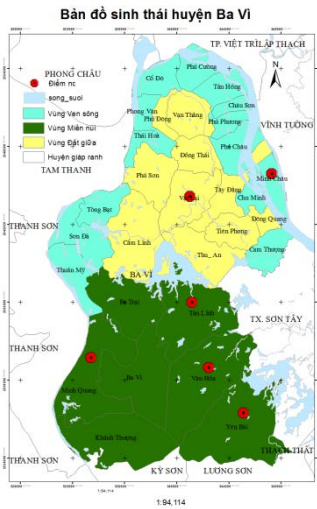
Supported by CCAFS, ILRI, in collaboration with IAE, has undertaken an extensive field study in Ba Vi District near Hanoi to develop up-to-date EFs that will inform both inventory and measurement and reporting commitments under COP 21.

Gathering data from about 200 farms on five occasions over the course of one year, we employed production data to produce individual (animal) EF estimates adapted from a new but accepted methodology developed for use in smallholder African farms (Goopy et al., 2018). The use of a strictly stratified and representative sampling protocol facilitated the upscaling of EFs for dairy, beef and buffalo on a district basis

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Comparison of current (Tier I IPCC) with (provisional) TIER II enteric Emission Factors (CH₄ kg/head/year) for dairy and beef cattle and Asian buffalo in the Ba Vi district, of Vietnam.

Animal species/ class	Sample Nos	Proportion in study (%)	Census Nos	Proportion in census (%)	Tier 1 EF (CH₄ kg/ head/ yr)	Total Emissions Tier I (CH₄kg/yr)	Revised (Tier 2) EF (CH₄ kg/head/yr)	Total emissions Tier 2 estimates (CH₄ kg/yr) in study	Revised total Emissions Tier 2 (kg/yr)
	Current situation using IPCC Tier 1 methodology						Results of Tier 2 approach (ILRI – IAE cooperation)		
Female Dairy >24 mo.	109	28.0					**81.7**	8,905.3	
Dairy Male	1	0.3			**56**		**59.3**	59.3	
Growing heifers 13-23mo.	29	7.5					**42.4**	1,229.6	
Dairy calves 0-12 mo.	56	14.4					**35.7**	1,999.2	
Dairy cattle (All)	**195**	**50.1**	**6,670**	**37.4**		**373,520**	**62.5**	**12,193.4**	**417,077.1**
Female Buffalo >24 mo.	20	4.33					**57.0**	1,140	
Buffalo (males)	3	0.65			**55**		**71.2**	2,13.6	
Growing Buffalo 13-23 mo.	2	0.43					**44.1**	88.2	
Buffalo calves 0-12 months	12	2.59					**51.1**	613.2	
Buffalo (All)	**37**	**8.0**	**1,700**	**9.5**		**93,500**	**55.5**	**2,055**	**94,421.4**
Beef >24 months	137	24.64					**39.3**	5,384.1	
Growing Beef 13-23 months	34	6.12			**44**		**38.3**	1,302.2	
Beef calves 0-12 months	62	11.15					**33.9**	2,101.8	
Beef Cattle (All)	**233**	**41.9**	**9,480**	**53.1**		**417,120**	**37.7**	**8,788.1**	**357,562.8**
TOTAL	**465**		**17,850**			**884,140**			**869,061.3**

Analysis is ongoing and its expected results will be published by mid-2019. However, preliminary results (based on data from season 1) indicate that emission estimates for mature dairy cattle are underestimated by about 46% if the standard IPCC Tier 1 approach is used. This is at least a reflection of the large changes, which have occurred in the Vietnamese dairy sector in the past 20 years, but also highlights the dangers on relying on obsolete data in making decisions for mitigation and adaptation.

This study provides a valuable first step in providing revised emissions estimates for the Vietnamese livestock sector and may be considered to be robust and reliable. However, it must be stressed, that in a country as climatically heterogenous as Vietnam, data from no one area can be assumed to be representative of the situation for the country as a whole and further studies are required to inform national estimates.

Goopy, J. P., A. A. Onyango, U. Dickhoefer, and K. Butterbach-Bahl. 2018. A new approach for improving emission factors for enteric methane emissions of cattle in smallholder systems of East Africa – Results for Nyando, Western Kenya. Agricultural Systems 161: 72-80.

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The Gendered contributions to mitigation (GeMi) in coffee-based agroforestry systems

The GeMi project is being implemented in the provinces of Dien Bien and Son La in the Northern uplands of Viet Nam by The World Agroforestry Centre (ICRAF) Viet Nam, in partnership with the Vietnamese office of CARE International (CARE). The project aims to evaluate the impact of the Village Saving and Loan Association (VSLA) model complemented with training on coffee agroforestry on (1) women's empowerment, (2) household welfare, (3) value chain dynamics and (4) climate change mitigation. The GeMi project will help inform and provide recommendations to improve the viability of VSLA and the many microfinance programs that other development partners are using in agroforestry and other value chains.

A baseline study has been conducted from 10th to 20th April 2018 in two communes in Muong Ang District in Dien Bien Province and two communes in Mai Son District in Son La Province. The study consists of eight focus group discussions and a household survey on a sample population consisting of both an intervention group (i.e. VSLA participants) and a control group (i.e. non-VSLA participants). The focus group discussions (two female groups and two male groups in each province) were held separately by male and female facilitators accordingly. Overall, a total of 324 respondents were interviewed for the household survey.
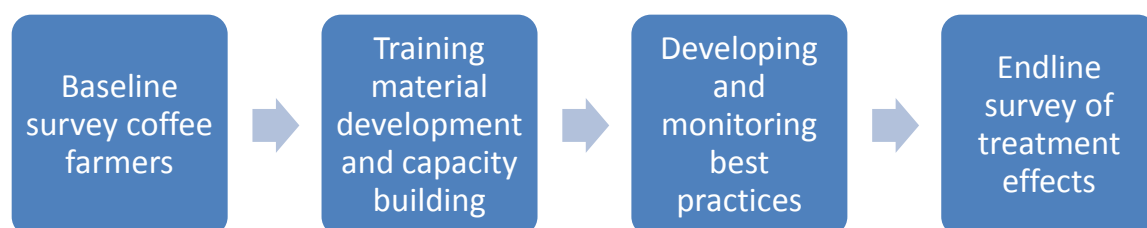
Areas and indicators of gender impacts have been identified based on the findings of the baseline study to inform the focus of gender trainings and gender aspects of the monitoring and evaluation framework. The following areas are under intervention through trainings and will be monitored for changes in:

- Number and percentage of female coffee farmers who can equally participate in household financial decision making, especially in investment for production, in household expenditures and in use of income.

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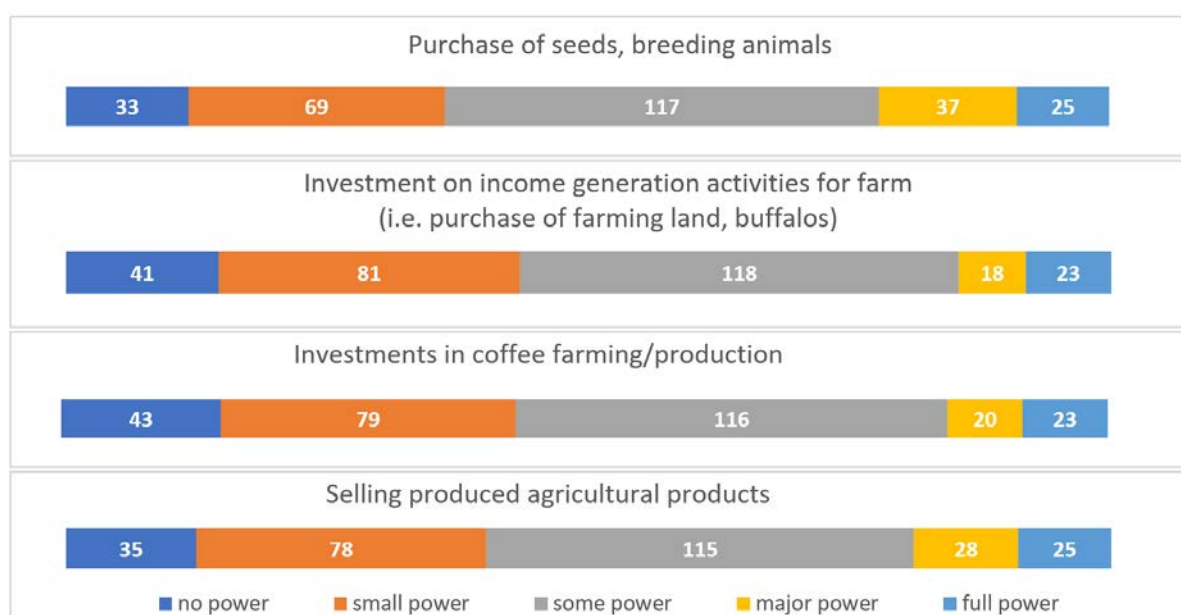
- Number and percentage of female and male coffee farmers who demonstrate gender-equitable attitudes and practices, especially:
  - Attitudes towards certain gender norms: *Housework is women's work, Men should make the most important decisions, Men do heavy work and women do lighter work, Women are not as good as financial management as men*
  - Gender division of labour in the family and coffee value chain
  - Changes in women's time for the work and rest

Several technical trainings were already conducted throughout the year, including: gender awareness raising, household financial literacy and coffee-based agroforestry systems management. Scientific papers are also being prepared. Training materials are developed as handouts for farmers: *Posters: Technical guidance on coffee-based agroforestry systems management* alongside with *"How-to…" video series.*

Baseline survey coffee farmers	→	Training material development and capacity building	→	Developing and monitoring best practices	→	Endline survey of treatment effects

Project work packages

Purchase of seeds, breeding animals

no power	small power	some power	major power	full power
33	69	117	37	25

Investment on income generation activities for farm (i.e. purchase of farming land, buffalos)

| 41 | 81 | 118 | 18 | 23 |

Investments in coffee farming/production

| 43 | 79 | 116 | 20 | 23 |

Selling produced agricultural products

| 35 | 78 | 115 | 28 | 25 |

A figure extracted from the baseline survey report showing the power in making decision of women from both provinces (number of respondent)

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P264: Identifying CSA for different provinces in Vietnam and developing the CSV regulations for Ma CSV

Ma Village is one of the six CSVs established by CCAFS SEA. During the past few years, efforts were spent by CCAFS and its partners to support this village, mainly in capacity building and in promoting CSA practices. A library was installed near the newly improved village meeting hall, equipped with a desk computer, a printer, and a variety of publications. The village's loudspeaker system also improved for better dissemination of daily weather forecast, farming advisories, and farming practices and technologies. Great attempts have also been spent for trainings and demonstrations on CSA practices, specifically rice residue composting, vermin-culture, livestock waste management and ICM.

Towards large-scale adoption of CSA practice, not only within Ma CSV but also in the province of Yen Bai and the whole country, this year, our efforts aim (i) to strengthen common understanding of Ma villagers in the needs for maintaining CSV and relating activities beyond the end of supporting activities, and (ii) to document and disseminate information on CSA practices and systems suitable for different locations in the country.

With the project's facilitation, people of Ma Village have developed a draft CSV regulation, comprising 13 chapters and 30 articles. The main objective of this regulation is to ensure long-term commitment of all the villagers in treatment of agricultural and living waste, management of community assets (e.g. library, broadcasting system, meeting hall etc.), protection of environment and natural assets, and common actions for adaptation and mitigation of climate change. During the first months of implementing the regulation, its articles will be revised to suit the needs and context of Ma Village.

In total, 56 existing CSA practices and systems in Vietnam were identified as priority for adoption by provinces in their implementation of NAP and NIDC. These could be grouped as (i) pest control and production of quality products, (ii) protection and sustainable use of cultivated land and water resource, (iii) agroforestry and integrated cropping systems, (iv) paddy rice production, (v) livestock and (vi) aquaculture.

The needs and the suitability for their adoption depend on the specific contexts in each location and province. Information is then being gathered and analysed in order to identify locations where each of these practices need to be promoted and could be promoted easily, and where their adoption is needed but could only be promoted after significant difficulties/barriers are addressed. This will serve as an evidence base for provinces to achieve CSA development.

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P264: Pest Smart: Strengthening ecosystem health and building resilience of Climate Smart Villages

Climate change can affect crops directly due to temperature changes, salt exposure due to sea level rise, and increased risk of prolonged droughts, incessant rainfall resulting in flooding or severe storms. Climate change can also indirectly contribute to farmers losses, by modifying the abiotic conditions

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under which organisms normally live through. Crops under drought or extended rain can experience higher physical and physiological stress (e.g. elevated CO_2 levels) or have higher probability of infection. A few insect populations can also build up rapidly when experiencing higher temperatures.

Climate change then has a significant role by affecting farmers' income and, as a result, their livelihoods due to unpredictable pests and diseases scenarios. Conversely, current farmers' practices can have profound effects on climate change by increasing greenhouse gases emissions due to excessive use of pesticides and fertilizers.

Pest Smart aims to reduce the use of pesticides and fertilizers, which can further help in mitigating the risk of pests and diseases in the context of climate change. These measures will help towards reducing the carbon footprint and increasing non-chemical options through capacity building and awareness. In 2015 and 2016, we have identified the main pests and diseases in three CSVs: Tra Hat (Vietnam), Rohal Soung (Cambodia) and Ekxang (Laos). Furthermore, farmers have been involved in trainings either to manage major pests that affect their crops (invasive snails and rodents) or to learn and experiment how they can improve habitats to accommodate the predators of pests on their farms (ecological engineering using cosmos flowers on rice bunds).

Farmers are supported by extension staff trained as plant doctors and can diagnose the main pests and diseases (P&D) that farmers bring to plant clinics. The last two years focused on strengthening the farmers' resilience to climate change impacts and on fostering the adoption of alternative and safer methods for pest control.

In 2018, the following significant outputs were produced in the 3 CSVs:

- A School Awareness Day was organized in Tra Hat CSV to sensitize youth to climate change issues and their effects on P&Ds; this 'citizen science' approach helps with greater buy-in into CC-related challenges faced by the farmers;
- Training of Plant Doctors and Extension Staff on Biocontrol in Ekxang CSV;
- Ecological Engineering was scaled out from 3 hectares in 2017 to 18 hectares in 2018 in Rohal Suong CSV;
- Surveys on knowledge and adoption of Pest-Smart practices by farmers have been conducted in all CSVs; surveys on knowledge and use of bio-based alternatives in Ekxang CSV; and
- A manual "***Pest-Smart practices and Early Warning System under Climate Change***" was published for rice crop in the CCFAS website (Costa et al. 2018) and will be disseminated in local languages in all CSVs. Factsheets and hand-outs to learn how to plant flowers on rice bunds have been also edited while two blogs are in preparation, one on the School Awareness Day in Tra Hat and one related to the use of Biocontrol in Ekxang CSV.

From Left to Right and Top to Bottom:

1. Adoption surveys in Ekxang; 2. Discussions in Tra Hat village to increase farmers 'outreach;

3. School Awareness Day in Tra Hat; 4. Rice bunds with Cosmos flowers in Rohal Suong

- **Key support outcomes of Pest Smart in this project** are:
  o Increased the knowledge and awareness of farmers (including gender compliance) and extension staff through on-site demonstrations and participatory research on CSA and bio-based technologies against key P&D present in farms and are impacting crops in the CSVs.
  o Trained extension staff in the CSVs using CABI's award-winning Plantwise program with innovative extension framework on plant clinics and P&D knowledge bank to enhance their capacity on managing pests and diseases.
  o Enhanced the adoption of Pest Smart practices such as ecological engineering for rice cultivation.
  o Created opportunities on mainstreaming and scaling up awareness of pest-smart practices through a citizen science approach with school children in the CSVs.
  o Documented (via a Manual) Early Warning System and P&D management practices in rice to empower extension staffs and farmers against unpredictable P&Ds in rice and other common livelihood crops such as fruit and vegetables.

Cover page of Manual

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P264: Development of training materials on climate-smart rice production for extension staff and rice farmers

The National Agriculture Extension Center (NAEC) is an institution under the MARD in Vietnam. Its core functions are to provide trainings to extension staff and farmers in Vietnam, implement agricultural extension projects, and transfer advanced agricultural technology to farmers. Aside from these core functions, NAEC collaborates with other countries in the Southeast Asian region to implement agricultural extension activities to improve the farmers' wellbeing. The Center was established per Resolution no.02/2010/ND-CP on agriculture extension works.

EXPECTED OUTPUTS

The cooperation aims to produce the following outputs:
- a completed set of presentation materials for training on sustainable rice production;
- a completed set of training manual to guide trainers in conducting the training courses on sustainable rice production; and
- a decision made by NAEC to approve the training manual as the official material that will be used in the national extension system from the central to the local level.

MAJOR OUTPUTS

The draft presentation materials on sustainable rice production are already available. These materials will be complemented with training manuals on climate change, cropping calendar, and management of water, nutrients, pests and diseases, wastes and by-products, and rice value chain and household finance. Another module will discuss skills-specific trainings for the farmers.

Module 1 will tackle climate change and GHG emissions in rice production. Trainees will then learn mitigation strategies on rice production to reduce the GHG emissions from this sector.

Module 2 will focus on building an adaptive cropping calendar, together with teaching more about rice varieties, soil preparation, and crop establishment. In module 3, the trainees will learn water management, specifically the water needs of rice crops, the climate and hydrological patterns that influence the availability of water, and various irrigation practices applicable for alluvial (fluvisol), acid sulfate-rich, and saline soils.

Nutrient management is another key aspect of climate-smart rice production, which will be discussed in Module 4. In this module, trainees will learn how to properly fertilize their rice crops. They will study various fertilization techniques for the selected soil types: alluvial, sandy, nutrient-poor, organic-rich, acid sulphate, and saline. They will then build on these lessons to learn integrated nutrient management for rice.

Farmers will also learn how to protect their crops from pests and diseases that are emerging due to climate change. Through the Module 5, which tackles pest and disease management, they will study different pests such as the brown hopper, leaf roller, rice case worm (*Nymphuladepunctalis*), rice stem gall midge (*Didymomyiatiliacea*), and panicle rice mite (*Steneotarsonemusspinki*), as well as various

diseases such as *Rhizoctonia solani* Kuhn, rice blast (*Pyricularia oryzae* Cav.), *Xanthomonas oryzae*, rice grassy stunt virus, rice transitory yellowing virus, and pancile blight disease. They will also study rodents, the golden apple snail, and natural predators of pests in rice. Moreover, they will undergo trainings on weed management and biological and ecological pest control.

Module 6 will teach the farmers how to manage their wastes and by-products and reduce their losses in the post-harvest process. In Module 7, they will learn how to manage financial resources in the household level. Household financial management will be complemented with lessons on rice value chain.

Finally, Module 8 will focus on specific skills that will help the trainees out-scale what they will learn and evaluate their performances: developing training module; presenting in public; establishing a farmer field school; and evaluating trainings.

The development of training manuals, test trainings, and launching workshop will be organized during the first quarter of 2019.

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P264: Factors affecting farmer adoption of climate-smart aquaculture in Thanh Hoa, Vietnam

This research launched through the valuable financial and technical support of IRRI under the CCAFS. In this research, the econometric model was applied to measure the factors affecting the adoption of climate-smart integrated aquaculture (CSAq) in North Central Coast of Vietnam.

Data were collected from 200 improved extensive aquaculture farms with and without tilapia integration in coastal areas of Thanh Hoa Province. The study found six key factors, those that bring positive influence on the CSAq adoption behavior among farmers: the household's labour availability (numbers of household's members); economic efficiency of CSAq farming system; environmental improvement of ponds (decrease of organic waste in pond bed); higher price of CSAq products; access to technical information; and ensured food security for the farming household. The result also indicated that about 72.5% of farmer's CSAq adoption behaviour can be explained by independent variables in the model, in which economic efficiency is the most influencing factor (18.2%), followed by environmental improvement of ponds (10.70%), and the market price of CSA products (8.2%).

To successfully promote the out-scaling of CSAq in the North Central Coast of Vietnam, improving economic efficiency and raising awareness about CSAq system among coastal farmers are important solutions. Moreover, developing value chain of CSAq products in order to improve the quality and price of the products should be noted.

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P264: CSV Roving Workshop: Developing climate-smart farmers using knowledge-sharing and on-site learning approaches

In 2014, CCAFS SEA established the six Climate Smart Villages in the region, serving as models of climate-resilient communities and field laboratories of CSA T&P. CCAFS SEA and various CGIAR Centers have conducted different studies and transferred a wide range of CSA technologies and practices in those villages.

To make sure the technologies and practices are fully adopted by the farmers, capacity building activities have been implemented to build a network of climate-smart farmers. The CSV roving workshop is then being organized annually in different countries as a capacity building session for farmers and local technical staff. Currently, CCAFS SEA organized four CSV Roving Workshop in the Philippines (2015), Vietnam (2016), Cambodia (2017), and Lao PDR (2018), with the total number of participants of 140, 83 of which are farmers.

Different CSA technologies and practices were discussed, visited and out-scaled by the farmers in the six CSVs. They are sloppy land cultivation; climate stress tolerant rice varieties selection, integrated garden system; living bed (bio-mat) for livestock; vermin-composting, and rice-fish farming system, among others. During the four roving workshops organized, a diverse group of stakeholders was involved in sharing knowledge, facilitating, and organizing site visit for the participants. The stakeholders were Ministries of Agriculture, National Agricultural Research Organizations (VAAS, NAFRI, PhilRice), NGOs (IIRR, Care International, Aphivat Strey (AS), CUSO International) and universities and colleges (Vietnam National University of Agriculture, Battambang University, Savannakhet University, Don Bosco Vocational College).

The CSV Roving Workshop was proven as an effective communication channel which directly provides information on CSA technologies and practices to the farmers, enhances the famers' perception of innovation adaptability, and reduce the uncertainties about the risks and benefits of adoption.

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P264: Radio broadcasting campaign on CSA in the Philippines

In 2015-2016, the Philippine Federation of Rural Broadcasters (PFRB), in collaboration with the Department of Agriculture Regional Field Offices (DA-RFOs) and with support from CCAFS SEA, launched a pilot radio campaign on CSA to farmers, fisherfolk, and farm communities in the Philippines. In this nationwide campaign, PFRB organized three regional seminar workshops in Luzon, Visayas, and Mindanao. The Federation prepared and distributed ready-to-be-aired (RTBA) broadcast materials in the form of scripts (Announces folder) and recorded interviews (canned on CD) on CSA with subject matter specialists and selected focal persons.

Broadcast Materials

The materials include 150 RTBAs stored in folder and compact disks. These were written in five dialects (Tagalog, Ilocano, Visayas, Ilonggo and Bicolano) and distributed to about 150 active PFRB members with regular programs in different private and government radio stations and community radio stations. It is estimated to have reached about 2 million listeners.

INCEPTION MEETING 1

The initial activity for phase 2 started with an inception meeting held at DA-ATI Central Office on 7 August 2018.

This coincided with the reorganization of PFRB officers and the members of the Board of Directors. Dr. Leocadio Sebastian, Regional Program Leader of CCAFS SEA, and Dr. Rex Navarro, a CCAFS SEA Consultant, joined the group to identify the priority contents and messages of the RTBA broadcast materials. The new set of PFRB officers were inducted by Dr. Sebastian. Three vice presidents were elected for Luzon, Visayas, and Mindanao. Dr. Rogelio P. Matalang as Chair and President of PFRB will lead the campaign on climate change adaptation and mitigation, with the support of rural broadcasters in the entire archipelago.

This 2018, a second phase will be conducted to intensify, follow up, and expand the pilot campaign. A fresh batch of RTBA materials will be prepared consisting of expert interviews, spots, and jingles in four to five languages. The main topics of these materials will focus on CSA on other commodities other than rice. These will feature good agricultural practices (GAP) on adaptation and mitigation on the effects of climate change.

As of today, three regional seminar workshops were conducted with PFRB members. In Luzon (16), in Visayas (17) and in Mindanao (16) with a total of forty-nine (49) active members with regular programs. This excludes DA RFO2 farm-casters handling programs at DWDA FM *Radyo Pangkaunlaran*. Production of spots and jingles and interviews are ongoing. The target mass production of materials after pretesting is on November this year. However, the pretested spots and

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jingles are being aired over DWDA FM *Radyo Pangkaunlaran* and DWPE *Radyo Pilipinas*, an AM government station to elicit remarks and suggestions as to its contents.

Timeline

Distribution of RTBA materials to PFRB members will follow to start the airing on December 2018. Monthly monitoring will be conducted starting January 2018 to June 2018. A baseline survey to determine the extent of the awareness level of the audience as well as behavioral change of the adaptation and mitigation practices of farmers and farm communities. The study will be conducted by identified partner SUC's in Luzon, Visayas and Mindanao. This will be made possible through the support of CCAFS SEA in providing the funding of proposed study. (Dr. Rogelio P. Matalang, Chair and President, PFRB)

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P264: The radio-based distance learning (school-on-the-air) on CS rice production

Through the initiative of CCAFS SEA, the radio-based distance learning project, *"School-on-the Air (SOA) on Climate-Smart Agriculture cum Rice Production in Cagayan Valley,"* was launched by the Department of Agriculture - Regional Field Office 2 (DA- RFO2), with eighteen (18) partner agencies from Local Government Units (LGUs), national government agencies, state colleges and universities, media, and the private sector.

Conducted for five months, from March to August 2018, and dubbed as *"Kaalamang Pagsasaka sa Himpapawid: A School-on-the-Air Project on Climate Smart Agriculture (SOA-CSA) in Cagayan Valley,"* this project showcased Philippine Department of Agriculture Secretary Emmanuel F. Piñol's call to harness the power of radio in sharing improved agricultural technologies and support services to a critical mass of farmers. He being a veteran journalist and broadcaster has a regular program with a nationwide reach over a well-known radio station in the country.

The SOA aimed to:

1. facilitate the massive and sustained education of smallholder farmers on climate smart agriculture in the region through radio;
2. link small farmers with knowledge, technology and other support providers in the region;
3. heighten awareness and mobilize strong support and involvement of the rural populace in agriculture programs;
4. engage government agencies, local government units, civil society organization and the private sector in regional agriculture programs; and
5. serve as quick feedback mechanism and venue for dialogue among agriculture stakeholders in Cagayan Valley.

The topics discussed focused on the impacts and mitigation and adaptation measures on climate change, rice production technologies covering the whole value chain analysis. Additional topics are records keeping, product development, packaging and labelling and rice-based farming systems.

Weather forecasts/outlook from DOST-Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) was also aired in some episodes to inform farmers of relevant information that will aid them in planning their farming operations.

As to the profile and preferences of farmer enrolees, a focus group discussion (FGD) was conducted in the four provinces of Region 2. Data gathered are needed as basis in determining adoption of technologies and attitude change after the SOA.

A total of 10,078 individuals enrolled on the SOA. This is a total enumeration of the farmer-cooperators of the Rice Model Farm Cluster (RMFC) project being implemented by DA. In support to an effective learning process, the DA-RFO 02 distributed personalized notebooks to enrolees containing initial discussions of the modules. Resource persons were selected based on their expertise. They all came from the agencies involved in the SOA.

The SOA was officially launched on February 2018 in DA-Cagayan Valley, Cagayan with more than 400 participants. A mini exhibit featuring small equipment on rice production was staged. The heads of the agencies involved also forged and signed a Memorandum of Agreement (MOA) defining their roles and responsibilities. Episodes are canned, emailed and aired in critical time slots over twelve (12) community and commercial radio stations to cover a regionwide audience. The leading broadcast facility was DWDA Radyo Pangkaunlaran, the official radio station of DA-Regional Field Office No. 02.

Prizes like cellphones, transistor radios and e-loads are also given to winners of Question and Answer (Q&A) portion of every episode. As to monitoring and problem-solving activities, coordination meetings were conducted and attended by the Technical Working Group (TWG) members, Municipal SOA Coordinators and representatives of agencies.

On 24 August 2018, more than 5,000 of those enrolled in SOA-CSA project graduated *en masse* at the Isabela State University (ISU) in Echague, Isabela. The graduates went through 68 modules aired over five months in the entire Cagayan Valley.

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The top graduates were given plaque of recognition and incentives in cash and in kind. All the graduates were given certificates of participation, which were received by their respective Municipal Agriculturist. Special project awards (such as solar dryer) were also given to outstanding provincial and municipal LGUs as token of their active participation. Outstanding LGUs and clusters were also recognized for their support in the successful implementation of the SOA and Rice Model Farm Cluster project.

Likewise, a Regional Farmers Congress was conducted during the graduation. Topics discussed are the credit and insurance programs of the government. Speakers were technical staff of Agricultural Credit and Policy Council (ACPC) and Philippine Crop Insurance Corporation (PCIC).

After the graduation, DA-RFO 02 again conducted an FGD to initially evaluate the SOA. Various graduates from the Provinces of Cagayan and Isabela were interviewed. Respondents are thankful because of the new learnings they received. They are also requesting another SOA with corn and high-value crops as commodities.

As to key outputs, the enhanced awareness on CSA and rice production technologies with emphasis on value chain, stronger engagement of stakeholders in providing support services to agricultural programs, sustained food and nutrition security and livelihood projects are expected to be achieved.

As a result, resilient and productive people and villages are established brought by not only a single agency but coordinated and united effort of all stakeholders in agriculture. The SOA, so far, was considered the biggest and most comprehensive distances learning activity in the region and in the whole country.

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P264: StartUp Project for Climate-Smart Villages (CSVs): Platforms to Scaling Out Climate-Smart Agriculture and Community-Based Adaptation in Myanmar

Around 25% of Myanmar's households live below the official poverty line and about 10% live even below it. Household income is a key factor to ensuring food security in Myanmar where 68% of the household expenditures are spent on food. Myanmar is at risk from a wide range of natural hazards, including cyclones, floods, and droughts that severely affected the livelihoods of the poor and contributed to food insecurity. Poor women suffer more from hunger, food insecurity and the lack of adequate health services. Climate risks and associated livelihood impacts are an additional burden to local communities.

The manifestations of climate change differ across different agro-ecosystems in Myanmar. Climate change impacts and local responses are different from each agro-ecology; it is crucial that adaptation measures recognize the value of targeted, location-specific, community-based strategies and processes. These process-oriented approaches (community based adaptation or CBA), which feature technological, social, and institutional elements were tested in the Philippines by IIRR with support from CCAFS for the past four years and are currently being mainstreamed via national government processes.

With support from CCAFS in 2017 and with the International Development Research Center (IDRC)-Canada in 2018, IIRR is implementing participatory action research that aims to deepen

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and build upon current knowledge base on undertaking gender-sensitive, nutrition-friendly, community-based adaptation (CBA) and local-level scaling-out of climate smart agriculture (CSA) via the climate smart village approach. IIRR is currently implementing this action research in four CSVs representing four major agro-ecological regions of Myanmar namely; the central dry zone, mountain uplands, upland-plateau and delta and will run until 2020.

This participatory action research seeks to understand-- *How is the process of CBA differentiated in various agro-ecologies in Myanmar? How CSA approaches and CBA processes create opportunities for women's social and economic empowerment? What opportunities are there in CSA that address nutrition and food security issues of Myanmar? What pathways are present in Myanmar to scaling-out CSA and CBA processes?*

While the research in the CSV has started recently, IIRR has observed a number of emerging outcomes already. One emerging outcome is the increase uptake of CSA practices within each CSV as indicated by the increase of the number of farmers participating in the CSA testing and a number of these farmers-adoptors have also provided their own investment to the CSA practice.

Another emerging outcome is the increasing interest and demonstration of support by strategic government agencies and NGO networks to promote CSA via the CSVs. This is indicated by the support provided by the Department of the Agriculture Research and the Yezin Agriculture University —both agencies under the Ministry of Agriculture, Livestock and Irrigation (MoALI). IIRR is currently hosted at the Food Security Working Group in Yangon, which has allowed IIRR to work closely with the network of 200 plus member NGOs and individuals. As an example of this collaboration is the conduct of a study visit of the FSWG leaders to the IIRR's CSV in Guinyangan, Quezon, Philippines.

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The **CGIAR Research Program on Climate Change, Agriculture and Food Security** (CCAFS) is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT). CCAFS brings together the world's best researchers in agricultural science, development research, climate science and Earth System science, to identify and address the most important interactions, synergies and trade-offs between climate change, agriculture and food security. **(www.ccafs.cgiar.org)**

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The CCAFS Regional Program in Southeast Asia (CCAFS SEA) is hosted by the International Rice Research Institute, a member of the CGIAR Consortium.