Climate-Smart Agriculture in Southeast Asia
NOTES

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Mapping the problems and solutions: Implementing climate-smart agriculture actions in Mekong River Delta

Photo: Leo Sebastian (CCAFS)

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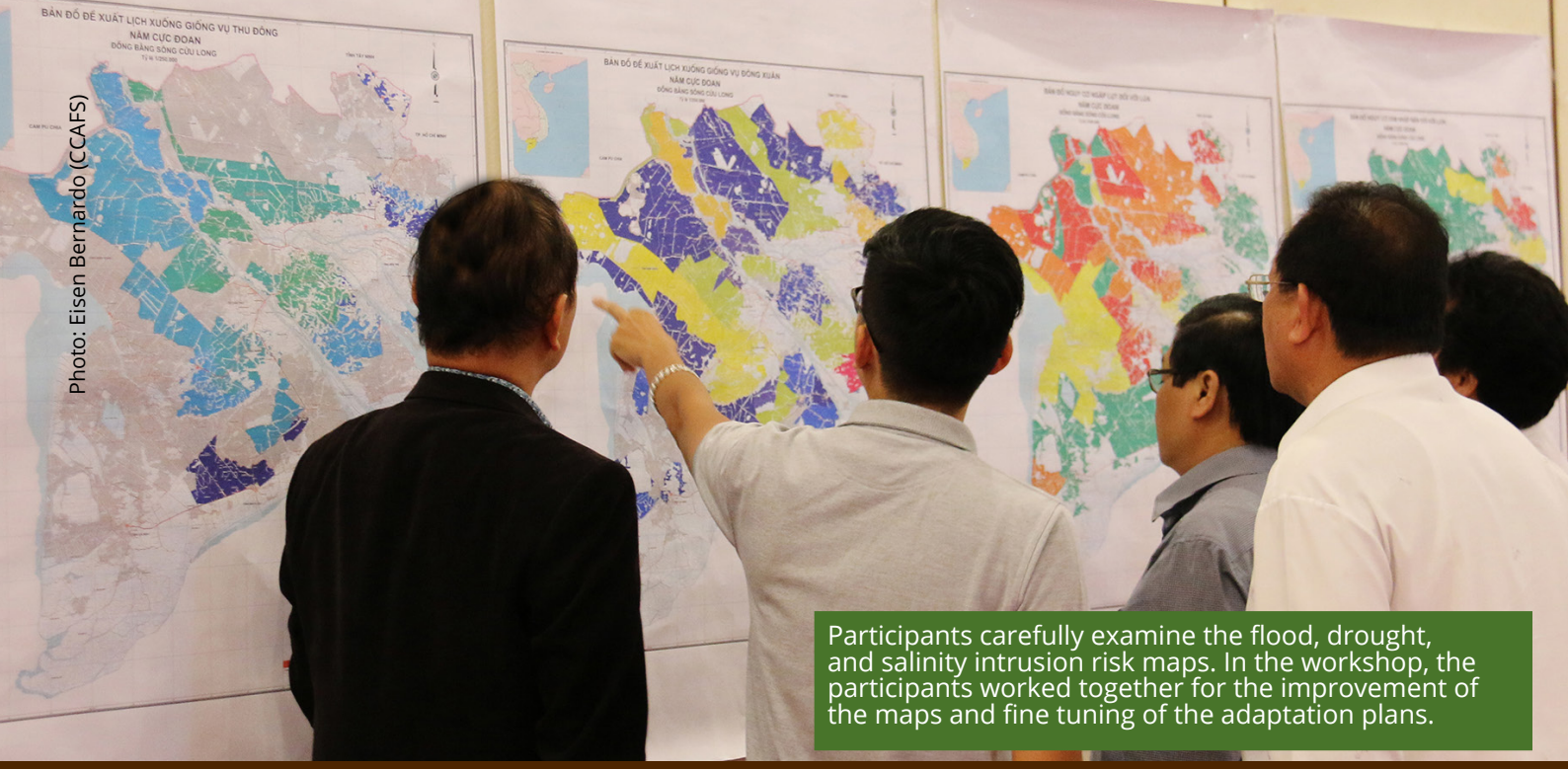

Photo: Eisen Bernardo (CCAFS)

Participants carefully examine the flood, drought, and salinity intrusion risk maps. In the workshop, the participants worked together for the improvement of the maps and fine tuning of the adaptation plans.

Mapping the problems and solutions: Implementing climate-smart agriculture actions in Mekong River Delta

by **Eisen Bernardo** (CCAFS Southeast Asia)

To address the impacts of drought, salinity intrusion, and flooding in rice production in the Mekong River Delta, a participatory climate-related risk mapping was conducted to develop adaptive measures.

Considered as the 'rice bowl' of Vietnam, the Mekong River Delta (MRD) region contributes 56% to the total domestic rice production and more than 90% to Vietnam's rice export. Over 1.5 million hectares of land, comprising more than half of the total arable land in the region, is being used for rice production. Almost 80% of its 17 million people rely heavily on rice cultivation for livelihood. With this significance in the agricultural economy, the region's rice production sector should be ready for the challenges of climate change.

In recent years, the region has been experiencing salinity intrusion and drought during winter-spring season and flooding during autumn-winter season. Incidence of El Niño and La Niña made the situation in the region even worse. For example, in 2016, El Niño intensified the drought in the region causing rice production loss of 700,000 tons.

To address these problems, the Department of Crop Production (DCP), together with the CGIAR Research Program of Climate Change, Agriculture, and Food Security (CCAFS), conducted a workshop on the development of responsive plans to cope with drought, salinity intrusion, and flooding in agricultural areas of the MRD. Using a regional integration perspective, the participants developed action plans on how to strengthen the rice production sector in response to the impacts of climate change.

Over a hundred participants, including government officials from various provincial and local government offices from the 13 provinces in the MRD region, representatives from the key national agencies, and experts from the academe, national and international research centers, attended the workshop held in Can Tho City, Vietnam on 21 July 2017. This is a follow up to the series of related activities done in MRD, such as the: assessment study of the 2016 El Niño; initial workshop on climate risk mapping held in November 2016; and separate provincial workshops conducted from March to May 2017.

Solving the problems using maps

The participatory development of climate-related risk maps and adaptive plan (Climate-Smart MAP) for rice-based cropping system was developed by CCAFS SEA to: explore common understanding of flood and salinity risks; see how local knowledge

Participatory mapping of climate-related risks in Mekong River Delta

Using participatory mapping, the Department of Crop Production of Vietnam, in cooperation with CCCAFS Southeast Asia and other institutions, developed flood, drought, and salinity intrusion risk maps, and adaptive cropping systems and cropping calendar for the provinces in the Mekong River Delta.

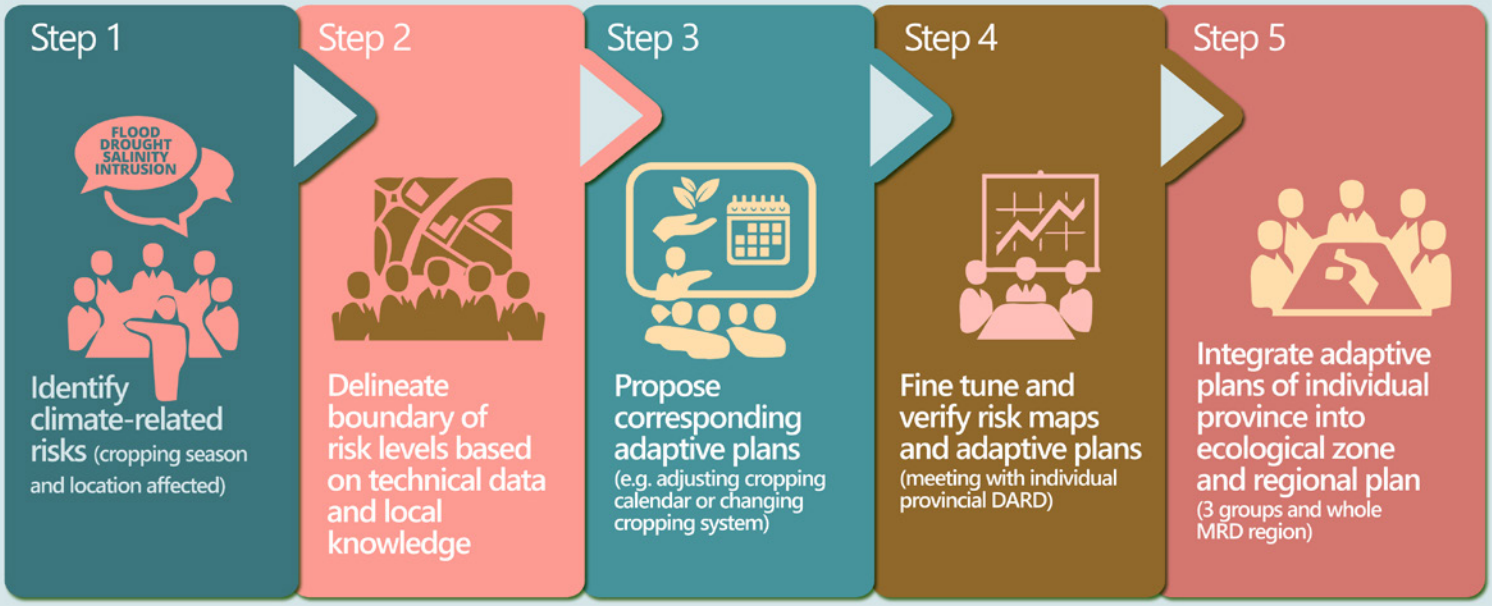

Image: Eisen Bernardo (CCAFS)

can be used in developing risk maps; and identify gaps in the methodology for further improvement.

Climate-Smart MAP was implemented in the 13 provinces of the MRD from November 2016 to May 2017. Based on the inputs of the researchers and experts, and indigenous knowledge on local topography, current infrastructure, hydrological management scheme, and provincial land use plans, risks maps on salinity intrusion, drought, and flooding were developed. Using these maps, each province formulated adaptation plans for their rice production system.

Dr. Leo Sebastian, regional leader of CCAFS-SEA, emphasized the role of using maps in addressing the impacts of climate change. He stressed to the participants that "maps open a lot of possibilities when adapting to climate change. Mapping might be simple, but it is a good starting point of a complex response that will be evolving in the future."

He challenged everyone to keep on improving the maps and using them, not only to address climate change, but most importantly to improve rice productivity.

Mapping the issues

During the workshop, the participants were divided into three groups based on agro-ecological condition of provinces to discuss and fine tune the maps produced under the implementation of Climate-Smart MAP. Several issues were identified by the participants regarding the accuracy and relevance of the maps, the appropriateness of the adaptive measures, and the implications of the individual provincial plans to each province and to the region as a whole.

With regards to the maps, the participants recognized the importance of updating some information. For instance, the most recent land use maps need to be used as basemaps for rice-based systems. They also proposed to add other risks aside from reduction of crop yield, and include other climate change impacts like sea level rise.

Management of water resources and adjustment of cropping calendar were the most common action plans among the 13 provinces. The participants proposed for the formation of a regional coordination board in order to harmonize all the proposed activities. Sharing of resources and infrastructure (e.g. water, irrigation facilities) and information (e.g. planting schedule, water release schedule) will reduce conflict among the provinces.

The participants also pushed for the improvement of the forecasting system especially for climate-related events like El Niño and La Niña. Climate information should be updated, relevant, and more accessible to the local governments and farmers.
Market information should be also included

in the planning process. The participants emphasized that the income of farmers is an equally important consideration in any climate change adaptation activity.

Moving on the right track

DCP and the provincial Department of Agriculture and Rural Development officials recognized the importance of the risks maps in developing short, medium, and long term agricultural land use plans of the individual provinces, as well as, of the whole MRD. In fact, in February 2017, the DCP issued the official direction to request MRD provinces to develop an action plan for actual implementation of adaptive rice-based systems and cropping calendar.

Responding to DCP's directive, several provinces have implemented their proposed plans. Tien Giang province, for example, has integrated the adaptive rice-based systems in their land use planning. To address problems of salinity intrusion and tidal rise, the province started cutting and shifting cropping system and calendar for its eastern districts. On the other hand, An Giang province has decided to shift the autumn-winter rice season earlier to ensure safe harvest before the annual flooding period from October to November.

Even with the success in the implementation of some provinces, there are still a lot of areas for improvement. In his message, Dr. Nguyen Hong Son, director of DCP, believed that there are still ways to make the maps better and more useful. We can downscale maps to district and commune levels, and develop maps for other crops aside from rice," he added.

He proposed further improvement of the maps and fine tuning of the adaptation plans.

The workshop participants formed small groups to discuss the issues concerning the specific areas of the MRD. The groups discussed the appropriateness of the adaptive measures, and the implications of the individual provincial plans to each province and to the region as a whole.

Using climate-smart MAP, the workshop participants developed action plans on how to strengthen the rice production sector in response to the impacts of climate change.

Learning from Vietnam's experience on Climate-Smart MAP - South-South Collaboration

by **Eisen Bernardo (CCAFS Southeast Asia)**

To promote regional knowledge exchange, Filipino and Thai experts interacted with their Vietnamese counterparts to observe the participatory climate-related risk mapping and adaptive planning (climate-smart MAP) in the Mekong River Delta.

Three staff from Thailand's Department of Agriculture (DOA) and one from the Philippines' Isabela State University (ISU) attended the workshop on the development of responsive plans to cope with drought, salinity intrusion, and flooding in agricultural areas of the Mekong River Delta (MRD). Held in Can Tho, Vietnam on 21 July 2017, they had chance to observe the climate risk mapping techniques and adaptive planning (Climate-Smart MAP) approaches used in Vietnam.

According to Dr. Leo Sebastian, regional leader of CGIAR Research Program of Climate Change, Agriculture, and Food Security in Southeast Asia (CCAFS SEA), the interaction program aims to show the collaborative activities CCAFS-SEA is doing with Vietnam's Ministry of Agriculture and Rural Development. He further stressed that "through this interaction with Vietnamese colleagues, CCAFS SEA can implement similar activities and develop similar plans for Thailand and the Philippines in the future."

Dr. Duong Van Chin, Chairman of CTARC, showcased to the group Loc Troi's rice varieties.

Photo: Eisen Bernardo (CCAFS)

One of the participants, Dr. William C. Medrano, Vice President for Research Development, Extension and Training of ISU, was impressed by how risk mapping and planning of adaptation strategies in respect to climate change was done at the provincial level. He also showed interest in the administrative arrangements of the risk mapping project, such as the roles and responsibilities of the different levels of governance in the mapping and planning activities.

Dr. Sebastian emphasized to the group the importance of climate-smart MAP. He said that "when thinking of solutions to climate-related issues, conflict arises. Maps inform the decision-makers and farmers of the risks. So, use them and take the risks." The group was interested to conduct climate-smart MAP in the areas prone to climate-related risks in Thailand and the Philippines.

The group also had the chance to visit the Dinh Thanh Agricultural Research Center (CTARC) of Loc Troi Group in An Giang province. CTARC is a privately-owned research institute working on plant breeding for rice, upland crops and vegetables, and doing applied research on plant protection, agronomy, and food processing, among others.

Dr. Duong Van Chin, Chairman of CTARC, showcased to the group their various products and technologies such as the Loc Troi rice varieties, rice-shrimp system, organic and bio solutions, and the Sustainable Rice Platform. He proudly shared the cooperation and extension activities of the company with the local farmer groups all over the country.

Thai participant Dr. Pichet Grudloyma, director of the Field and Renewable Energy Crops Research Institute of DOA commended Loc Troi's commitment in helping the Vietnamese farmers. He particularly emphasized that "the good extension services for the farmers might be the key factor in the success of adoption of new technologies."

Based on his observation, Dr. Medrano stressed that "the relationship between the company and the farmers is mutually beneficial and reinforcing - the one cannot exist without the other. The company does not make money at the expense of the farmers. Rather, they make money together with the farmers. That is a perfect business model for the agriculture sector."


The group discussed Climate-Smart MAP and planned to develop similar activities in Thailand and the Philippines.

Photo: Eisen Bernardo (CCAFS)

A landslide captured by Le Cong Uan, a farmer from My Loi village. Climate change is just one of the issues smallholder farmers have to face.

Photo: Abigail Smith, ICRAF

Models for a better future: Climate-smart agriculture is spreading

by **Abigail Smith (World Agroforestry Centre (ICRAF))**

Lessons learned and opportunities for bringing climate-smart practices to scale were shared among the participants of a climate-smart agriculture event in My Loi village, Vietnam.

Farmers, community members and local leaders gathered in My Loi Climate-Smart Village (CSV) in Ha Tinh province, Vietnam, to share lessons learned and future opportunities for expanding climate-smart practices throughout the region and beyond. The knowledge-sharing session was one of the activities for the climate-smart agriculture (CSA) event in My Loi, which was supported by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in Southeast Asia.

The main difficulties facing farmers in this region are related to soil erosion and degradation, as well as unpredictable seasonal weather patterns. Photographs taken by farmers were shared, many of which depicted images of flooding damage caused by severe storms in recent years. Le Cong Uan, a farmer from My Loi Village concerned about erosion stated, "landslides will cause the area of cultivated land to shrink". Meanwhile, Hi Minh Hieu shared an image of how "the 2015 drown (sic) the bridge and people were unable to walk."

These images highlighted the need for diversified production and environmental resilience. Mr. Tham, head of My Loi village, emphasized the importance of raising climate change awareness and its impacts at the local level, saying that "CSA practices can help reduce negative impacts on farmers' livelihoods and agricultural production in particular."

To devise climate-smart solutions to these challenges, twelve farmers, which were divided into four groups, built and presented 3D models for agroforestry systems. The models represent CSA practices which they believed to be promising for the area.

1. Native species and worms

The home garden model group suggested using native timber species as pillars for pepper crops, efficient resource cycling using livestock manure and crop residue in a vermiculture system, diverse vegetables fertilized with vermicompost, and agarwood windbreak along the edges.

"Utilizing wastes produced from agriculture and animal raising will help farmers save in the costs of production and reduce environmental pollution," said Mr. Duong Thanh Hai, one of the designers of this model.

The group also presented the Mac tree as a suitable living pillar for pepper, thus reducing the need to harvest trees from the forest. The tree is also a better alternative to cement pillars.

This model involves native timber species as pillars for pepper crops, efficient resource cycling, and agarwood windbreak along the edges. This would save on costs for farmers.

2. Mixed food crops

The intercropping model showed combinations of sweet potato-maize and cassava-peanut. Livestock production was improved using effective microorganism (EM) products and vermiculture for composting, and energy was captured for household use through biogas. The blue represents the composting hole, vermiculture enclosure, and livestock sties.

Beneficial EM cultures improve the efficiency of decomposing livestock wastes, thereby reducing the noxious smells and improving the hygiene in the sty.

“Intercropping cassava and peanut has been implemented for many years in our village, and it is very good one to maximize the outputs in one specific land area and the components provide complementary benefits to each other. Peanut, for example, can fix nitrogen in the soil, prevent soil moisture loss and its residue can be used as green manure to increase soil fertility,” said Van Thi Lai, who helped to build this model.

This model shows combinations of sweet potato-maize and cassava-peanut. As it has been implemented in the past, the farmers know the benefits of this system.

3. Trees on slopes

One agroforestry strategy for sloping land included orange and pomelo arranged in a spiral pattern with Arachis pintoi forage to prevent erosion. Other fruit trees were integrated into the landscape for production, such as durian and guava, and Dracontomelon duperranum as windbreaks. The spiral pattern improves water retention and prevents erosion on the sloping land, and also saves time and energy for farmers walking up the hill when tending the trees.

“I planted monoculture of cassava which required inputs every single year, caused soil erosion and degradation. Now, I have converted 1.2 ha of cassava to fruit trees in spiral pattern which is similar to contour planting, with Arachis pintoi and applied drip irrigation and pond to store water. I believe that this practice will provide higher income, adapt to drought and reduce soil erosion and soil moisture loss,” said Mr. Duong Duc Thai, a representative of agroforestry model group.

One agroforestry strategy for sloping land included orange and pomelo arranged in a spiral pattern with Arachis pintoi forage to prevent erosion. This model is similar to contour farming.

4. Spiraling tea

This agroforestry tea plantation model integrated fruit trees such as longan and lychee with forage grasses, medicinal plants including ginger, lemongrass and tangerine, and a pond as water source. While reducing erosion and maintaining water filtration on this sloping land, this system diversified the economic risk for the farmer. “Planting native trees such as jackfruit and Tac (a local mandarine) on the top of the hills together with countour plantation of tea in one side and fruit (longan and lychee) trees in other side will maintain water source for the lower area,” said Mr. Pham Huy Hoang, spokesman for the fourth modeling group. He added annual crops will provide short-term benefits to farmers while waiting for income from tea or fruits.

This model integrates tea plantations with fruit trees with forage grasses, medicinal plants, and a pond as water source. This will maintain the water resources for the lower areas.

The farmers' models highlight the importance of efficient resource cycling and integrating diverse crops and trees. These systems maximize beneficial outcomes such as microclimate regulation, erosion prevention, and improvement of soil moisture and fertility. The strategies of diversification, planting for erosion prevention, symbiotic crop pairings and resource cycling can be implemented in Ky Son or Ky Anh communes to improve productivity and resilience, or adapted for more general application in other areas based on topographical and climate factors.

The applicability and policy support for these models as well as CSA practices in general were discussed at the event. Over 160 individuals attended the CSA event, with television and print media coverage reaching many more. The provincial, district, and commune leaders provided information on the potential of future scaling for CSA practices through integration of CSA into future socio-economic, agricultural, and rural development plants at various levels. Ms. Nguyen Anh Ngoc, leader of Ky Son Commune People committee, said "there are potentials to integrate CSA approach into socio-economic and rural development plans of the commune because we can see some mutual benefits of these activities."

Farmer-to-farmer networking appears promising based on preliminary feedback from the event, with many attendees citing opportunities for improving resilience and resource efficiency on their own farms. Training events and support groups will continue to support broader adoption of CSA practices through farmer social networks. My Loi is one of the six CSVs in Southeast Asia supported by CCAFS, which aims to develop climate-smart farming techniques.

Photo: Abigail Smith, ICRAF

Farmers from My Loi CSV presented 3D models for agroforestry systems.

Photo: Abigail Smith, ICRAF

Van Thi Lai, one of the women participants, showcased her farm practices such as intercropping corn and cassava, using palm leaves as cooling and heating system for livestock, and converting of livestock waste to biogas.

A good shot for scaling up climate-smart agriculture: Photovoice in My Loi

by **Eisen Bernardo (CCAFS Southeast Asia)**

Using photography, farmers can document the impacts of climate change on agriculture, as well as share their own adaptation efforts.

To raise awareness about the impacts of climate change and the importance of adopting climate-smart agriculture (CSA) practices, a Photovoice project was conducted in My Loi village in Ha Tinh province, Vietnam. From May to July, 24 farmers attended workshops on basic camera techniques and visual storytelling to share real-life experiences concerning food security, climate change adaptation, and GHG emission reduction.

Using photography, the farmers documented and shared their experiences with fellow farmers and policymakers. On 6 July 2017, a CSA event was organized by the World Agroforestry Centre (ICRAF), in collaboration with the Ha Tinh Farmer's Union, Ky Son Youth Union, and Ky Son People's Committee. One major component of the event was the Photovoice exhibition where farmers showcased and narrated their experiences using photography.

The real picture

My Loi is one of the three Climate-Smart Villages (CSVs) in Vietnam under the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). These sites were prioritized due to their vulnerability to specific climate challenges like droughts, floods, hot spells, and cold snaps. Because of these weather events and climate variability, the livelihoods of farmers have become more at risk.

According to Duong Van Tham, head of My Loi village, "all the posters covered the most important issues related to climate change in our commune, including flooding, riverbank erosion, drought, and hot spell. But, the photos also tackled the efforts of local farmers to adapt and mitigate those impacts."

In his photo story, Phạm Huy Hoang recounted the effects of extreme flooding in his area, such as damaged houses, landslides, and losing arable lands. Heavy rains also affected the productivity and quality of the fruits and crops in the area. To prevent soil erosion and improve soil water-holding capacity, bamboo plantation in the landslide area along the riverbank was the adaptation measure applied by Mr. Pham.

Photovoice

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In Photovoice, local people use photography to communicate the issues and problems in their community, and share the solutions they have adopted. Photovoice is a participatory action research that builds on three main objectives: 1) identify and reflect on important issues that affect real life situations; 2) promote critical dialogue around the captured images which reflect local realities; and 3) communicate the identified issues with policymakers and other stakeholders to arrive at actionable solutions.

Steps in Conducting a Photovoice Project

1. Recruit a group of photovoice participants
2. Introduce the photovoice methodology to participants and facilitate group discussions
3. Explain what informed consent is
4. Pose an initial theme for taking pictures
5. Distribute cameras to participants and teach them how to use it
6. Allot time for participants to take pictures
7. Meet to discuss photographs
8. Select and recruit a target audience of policy makers or community leaders
9. Plan with participants a format to share photographs and stories with policy makers or community leaders
10. Participants to write their stories and prepare for exhibit
11. Village exhibit
12. Stakeholder dialogue

Image: Eisen Bernardo (CCAFS)

Reference: Camille A. Sutton-Brown (2014) Photovoice: A Methodological Guide, Photography and Culture, 7:2, 169-185

Through her picture story, Nguyen Thị Anh also encouraged the members of the village to plant bamboo as a strategy to prevent landslides in the area. She emphasized that the affected land is quite large, and that requires the whole community to work together.

Nguyen Tien Minh shared some of the adaptive farming practices in his photo story. To prevent erosion during the rainy season and retain soil moisture in the dry season, he intercropped peanuts with orange trees. After harvesting peanuts, the decomposed plant residue was recycled as fertilizer for the orange trees. Aside from the techniques and practices, information is also an essential tool for the farmers to reduce the impacts of climate change. Duong Xuan Linh showed the participants the importance of getting relevant and up-to-date climate information from the commune meteorology station and the village crop calendar.

Beyond the photographs

The Photovoice exhibition served as a knowledge-sharing platform among the farmers. About 160 participants attended the CSA event, with the hope that they become future agents of CSA outscaling in the community and nearby areas. For Nguyen Van Tam, a visiting farmer from Ma village, "there are many agricultural practices that can be seen from the Photovoice exhibition which are more advanced than in my village, such as using drip irrigation, enhancing soil quality and fruit tree growth with Arachis pintoi, among others." He also stated a willingness to share what the farmers in Ma are doing with farmers of Ky Son commune.

Duong Van Tham also emphasized the contribution of the Photovoice event in decision-making. He said that aside from creating awareness on climate change and its impacts to agricultural production in My Loi and neighboring villages, it is also a way to reach local authorities at all levels (provincial, district, and commune) and to acknowledge the efforts of local farmers in adapting to the adverse effects of climate change. Le Dinh Hoa, representative of the Ha Tinh Provincial Farmers Union, stressed that "each photo story is actually the current situation at the local level. This Photovoice exhibition is a good channel to help local authorities get information from the farmers that can be used in planning and policymaking."

Through participatory methods like the Photovoice, increased stakeholder engagement can be achieved. Le Thi Huyen, representative of the International Fund for Agricultural Development (IFAD) of Ha Tinh Province, observed that through the exhibition, she had an idea on how to engage and encourage farmers' participation in development projects. "The Photovoice exhibition was a very open and interactive channel, making it a successful tool in disseminating information and facilitating discussion on important topics like CSA," she shared.

Photo: Abigail Smith, ICRAF

In his photo story, Nguyen Thi Quy shared with the participants some technology in addressing water shortage especially during dry season. He is using drip irrigation in his farm, which is a highly efficient system requiring low volume of water.

Photo: Abigail Smith, ICRAF

Young students shared their artistic depictions of the challenges facing My Loi CSV. Youth should be involved in addressing climate change in their communities.

The art of adaptation: Engaging youth with climate-smart solutions

by **Abigail Smith (World Agroforestry Centre (ICRAF))**

Artworks by students, agricultural products, and farmer photographs show the importance of climate-smart agricultural practices in Vietnam.

Ten local primary school students presented artworks about local environmental challenges and future agricultural and rural development at a recent climate-smart agriculture (CSA) event in My Loi Climate-Smart Village (CSV), Ha Tinh province of Vietnam. The event is one of the social mobilization activities for the CSVs supported by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in Southeast Asia.

"Over the past few years we have developed a strong partnership with the Youth Union in Ky Son commune," said project leader Elisabeth Simelton. This partnership is critical for building up the next-generation farmers and young community members who will live with impacts of climate change, and will need to find new smart solutions to adapt.

Youth representatives from My Loi shared their artistic depictions of the challenges facing their community: "Please protect our forest and environment because many trees have been cut, which caused more flooding and damages to human," said Nguyen Thi Linh Nhi, student of grade 5, Ky Son primary school.

"Wastes from factory and reduction of trees on the forest caused environmental pollution. In this picture, the areas with darker colour are more polluted," said To Ngoc Le Vinh, grade 3 student of Ky Son primary school.

Nguyen Quoc Anh spoke about the need to develop rural areas while protecting the environment, and stated, "Factory production caused pollution in the river and the death of many species living in the river."

Other students highlighted their visions of how agriculture will change in the future. In the eyes of Le Thi Hien Luong, "Agriculture in the future will be applied with high technology (machine) in steading of buffalo for ploughing, and buffalo will be used for tourism and cultural activities." She added that if solar energy is used for the machine, it will reduce smoke released to the environment.

The main agricultural products of Ky Son commune, including jackfruit, bananas, corn, cassava, peanuts, pepper, onion, pumpkin, dry mandarin peel, and honey were displayed alongside the student artwork and farmer photographs detailing CSA practices and benefits.

It is critical for farmers to account for not only the landscape constraints and environmental factors, but also to consider market opportunities associated with various products. This is a particular concern for tree crops, which are longer-term investment. Some attendees at the event discussed the potential formation of a cooperative in order to facilitate larger-scale and more stable market pathways for certain products.

The CSA event was organized by the World Agroforestry Centre (ICRAF) in collaboration with the Ha Tinh Farmer's Union, Ky Son People's Committee and Ky Son Youth Union to create a space of learning, knowledge-sharing and networking.

Over 160 people gathered to share their experiences and learned about adaptive solutions from each other. Its purpose was to inspire the scaling out of the CSA approach, in particular to raise awareness about climate change impacts and enable farmers to share their experiences with CSA practices. Participants included representatives from IFAD, CIAT, Farmer's Union, local departments of agriculture and farmers from nine villages in Ky Son commune and Ma CSV in Yen Bai Province.

Officials from the village, commune and district level showed support for scaling CSA practices from government and policy-making leaders. Mr. Thuc, leader of My Loi village, said, "[The event] provided a wide range of information, from the impacts of climate change to the adaptation in agriculture production."

Agricultural products of Ky Son commune were displayed alongside the student artwork and farmer photographs. These would help farmers see market opportunities for the products.

Photo: Leo Sebastian (CCAFS)

Being one of the more vulnerable counties to climate change, Vietnam's Nationally Determined Contributions (NDC) aim to contribute towards a zero-carbon, climate-resilient future.

Climate experts identify building blocks of Vietnam's mitigation actions in rice

by **Eisen Bernardo (CCAFS SEA) and Bernadette Joven (IRRI)**

What does it take to plan and implement mitigation initiatives in rice production more effectively? Experts weigh in on science-based options for rice NAMAs in a policy workshop.

Vietnam has been taking decisive steps toward achieving a low-carbon rice sector. The country, through its Nationally Determined Contribution (NDC), has pledged to cut its greenhouse gas (GHG) emissions by up to 8%. This could be further increased to 25% by 2030 through international support, compared with the business-as-usual (BAU) scenario.

This is a significant contribution to the mitigation initiatives of Vietnam especially as it has the highest emissions from rice production in the Southeast Asia region (FAOSTAT, 2012).

Recently gaining momentum in Southeast Asia, NAMAs are proposed mitigation measures to reduce emissions below BAU levels contributing to sustainable development. It can take the form of a program, policy, regulation, or an incentive.

In developing rice NAMAs for Vietnam, experts stressed that they should be inclusive and appropriate to the needs and capacities of the communities, have institutionalized financial mechanisms and economic incentives, and forge strong collaboration among stakeholders.

Despite these, mitigation efforts in the country are constrained by a number of challenges.

Mitigation challenges and opportunities

A study conducted by the International Rice Research Institute (IRRI) and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) looked into the implementation of Vietnam's climate change policy particularly on mitigation actions in rice production.

Vietnam has strong institutional mandates on climate change policies but lacks clear policy guidelines and inducements to stimulate stakeholders' participation," reported Dr. Lucrecio Rebugio, SEARCA consultant, in a climate policy workshop on NAMA Formulation in Support of NDC Implementation on Vietnam's Rice Sector held on 20 June 2017 in Hanoi.

Vietnam's Institute of Agricultural Environment (IAE) and the Institute for Policy and Strategy for Agriculture and Rural Development co-organized the event under two IRRI projects: (1) Reducing Methane Emissions from Paddy Rice Production in Vietnam project being funded by the Climate and Clean Air Coalition (CCAC), and (2) Policy Information and Response Platform on Climate Change and Rice in the ASEAN (PIRCCA) project, funded by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

A policy gap analysis conducted by Ms. Nguyen Thi Dieu Trinh of Vietnam's Ministry of Planning and Investment (MPI) complements SEARCA's study and points to the importance of

integrating climate resilience and low emission rice development in revising the current Rice Restructuring Strategy. "It should identify emission reduction targets, technical solutions, and estimated investment needs," Ms Dieu Trinh emphasized.

In his presentation, Valerien Pede, senior scientist at IRRI, emphasized the importance of bridging the gap between science and policy. For effective policy engagement, knowing national priorities and getting the interest of policy makers is a must. Producing scientific reports and publications is not sufficient to influence policy, but recommendations should be translated into clear spatial and temporal priorities at different scales," he explained.

Meryl Richards, CCAFS expert on low emissions development, shared findings from their project on developing low emissions development investment plans for the rice sector in the Mekong River Delta. She challenged the participants to make sure that products of research feed into NAMA proposals.

Dr. Mai Van Trinh of IAE gave an example of such research output and presented the results of a cost-benefit analysis of GHG mitigation options in the Mekong River Delta. The alternate wetting and drying (AWD) technology, for example, has been proven to be suitable in the area in terms of reducing water use and mitigating GHG emissions in rice production. AWD can also provide higher profit to farmers, hence making it a good fit for a NAMA.

"The analysis will help meet these demands from an investment point of view," said Ms Dieu Trinh. She emphasized the role of the private sector stating "I encourage the group to make the research results more appealing to the private sector as they could potentially support NAMA programs."

Participating climate experts and policymakers also raised some constraints that deter the planning and implementation of a rice NAMA in the country, like the lack of an approved Measurement, Reporting and Verification (MRV) system at all levels and the limited access to national and foreign climate finance. The group expressed the need to identify avenues on how to fund a rice NAMA as well as to establish creative and sustainable financial mechanisms and incentives for projects and activities within a rice NAMA.

A promising model for NAMA initiatives

A concrete example of NAMA in the works is the Thai Rice NAMA project.

The Thai Rice NAMA project, which is now in the proposal development stage, will adopt the Sustainable Rice Platform (SRP) Standard which pushes for resource-use efficiency and sustainability in the rice sector.

"The Thai rice NAMA aims to reduce greenhouse gas (GHG) emissions, mainly methane, from irrigated rice cultivation in six focus provinces in the Central Plains of Thailand. The project expects to involve 100,000 rice farming households, and farmers' organizations in the drive to reduce GHG emissions from rice fields," explained Dr. Reiner Wassmann, climate change expert at IRRI.

By and large, mitigation initiatives are for the long haul but appropriate plans and climate policies need to be firmed up urgently for ground actions to effectively materialize. In the case of Vietnam, the government is clearly taking significant and decisive steps toward achieving their mitigation targets.

The 1st Stakeholder Engagement Workshop: NAMA formulation in support of NDC implementation in the rice sector of Viet Nam, organized by IRRI and the CCAFS SEA together with Vietnam's Institute of Agricultural Environment and Institute for Policy and Strategy for Agricultural Development, was held on 20 June 2017 at the Women Development Center, Hanoi, Vietnam.

Photo: Eisen Bernardo (CCAFS)

Stakeholders discuss the development of NAMA in support of NDC implementation in Vietnam's rice sector.

From concept to action: How IRRI supports mitigation plans for rice in Asia

Photo: IRRI Archive

IRRI has been doing research to determine interventions that could effectively reduce gas emissions from rice production. Photo shows a farmer measuring the water level in his rice field using the AWD tube.

Climate change mitigation in the rice sector cannot be all talk. It calls for appropriate strategies and proper execution of plans so as to achieve country commitments that would translate to global targets.

Despite a few setbacks, global climate agreements continue to tread a positive path with more nations joining in, signifying official support to the Paris Agreement. At this point, many countries are moving toward the implementation of concrete mitigation programs, but there is a clear under-representation of the agriculture sector especially in Southeast Asia.

One possible mechanism to reach scale in implementing mitigation technologies is the concept of Nationally Appropriate Mitigation Actions (NAMAs) in which government agencies such as agriculture ministries define projects with clear mitigation targets.

The need for rice NAMA

Globally, agriculture contributes 10-12% of the greenhouse gas (GHG) emissions, but this percentage is higher in most Southeast Asian countries due to extensive rice production. While climate change impacts rice production, conversely, rice production contributes to global warming, hence the significance of mitigating emissions from rice production.

NAMAs may be funded out of different sources ranging from national budgets, bilateral donors or international funding agencies. This funding mechanism has been conceived and discussed at various climate change conferences since 2007, but the number of NAMA projects is so far lagging behind expectations. This had led to the formation of new funding agencies like the NAMA Facility and the Climate and Clean Air Coalition (CCAC) with a specific mandate for supporting the design and implementation of mitigation projects.

IRRI's Mitigation Initiatives

The International Rice Research Institute (IRRI) is currently co-developing a NAMA prototype for the rice sector of Thailand jointly with the Thai Rice Department, GIZ (Germany), the Sustainable Rice Platform (SRP), and other partners from the public and private sector. This consortium has been selected by the NAMA Facility for developing a full proposal targeting mitigation in six provinces in Central Thailand within a Detailed Preparation Phase.

Proposal development has to be completed until November 2017. IRRI's tasks comprise: (a) assessing GHG savings under different mitigation

scenarios and (b) technical backstopping on the implementation of alternate wetting and drying (AWD) in combination with Laser Land Levelling (LLL), and other crop management options.
"As a direct outcome of the pre-proposal review of Thai NAMA conducted by the NAMA Facility, the project will maintain its focus on applying AWD and SRP standard, incorporating the use of complementary technologies in our approach as a means to maximize the mitigation effect," says Reiner Wassmann, IRRI's climate change coordinator. "Thus, we have now teamed-up with IRRI colleagues from the Postharvest and Mechanization Unit to ensure technical expertise on LLL, straw management, fertilizer spreading, etc," added Wassmann. In another project conducted in Vietnam and Bangladesh, IRRI is providing technical and policy guidance to policymakers for implementing GHG mitigation technologies.

The project titled Mitigation Options to Reduce Methane Emission in Paddy Rice is funded by the CACC and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). It aims to provide the foundation for future NAMA or 'NAMA-like' projects in the rice sector.

"This project focuses on the outscaling of the AWD technology in Vietnam and Bangladesh, for example, through the support of national plans with suitability maps," explained Ole Sander, climate change scientist at IRRI.

The AWD technology, developed by IRRI and its partners, addresses the twin problems of adaptation and mitigation through efficient water management. It enables farmers to save up on irrigation water by up to 30% and reduces methane emissions by 30-70% without yield penalty. This water-saving approach was also incorporated in the SRP standard that was designed to ensure sustainability of rice production systems.

Recognizing the well-established benefits with the use of AWD, two consortia in Vietnam and Bangladesh, which include their agriculture ministries, developed a work plan with IRRI for scaling-out AWD in rice.

Our national partners in both countries are strongly engaged in developing region-specific strategies for scaling-out mitigation options in rice production. Collaboratively, we are developing solutions for specific local problems and bottlenecks," said Dr. Sander.

To facilitate information sharing, IRRI put up an online knowledge hub where information on an array of mitigation technologies and practices can be accessed.

Moving forward

To streamline the activities in different countries, IRRI intends to establish a 'Rice NAMA Clearing House'.

The Clearing House will serve as a one-stop information platform for technical advice and collaborative engagement as we steer forward NAMA-related programs and projects in Asia," said Dr. Sander.

To this end, IRRI has initiated a Stakeholder Workshop on Climate Change Policies in Hanoi on 20 June 2017 to discuss the Rice NAMA plans in Vietnam.

To train a cadre of experts on climate change mitigation, IRRI will soon offer a training course on mitigation in rice production which will feature various technologies and practices in Southeast Asia, and offer skills training on GHG calculation tools. This would be vital for rice-growing countries as they formulate and implement their rice NAMAs.

Photo: Leo Sebastian (CCAFS)

alternate wetting and drying (AWD)

Photo: Leo Sebastian (CCAFS)

During the evaluation activity for the participatory variety selection in Ma Climate Smart-Village, Vietnam. Integrated crop management practices would help the farmers adapt to climate change.

Is integrated crop management in Vietnam climate-smart?

by **Amy Cruz (World Agroforestry Centre (ICRAF) and CCAFS Southeast Asia)**

Famers from Ma Climate-Smart Village in Vietnam participate in the evaluation of integrated crop management as a potential climate-smart agriculture practice.

Communities should treat climate change as both a challenge to overcome, as well as an opportunity to improve their livelihoods. However, for that to happen, farmers especially need to adopt "climate-smart" practices that could ensure their productivity and increase their resilience to changes in the climate.
One way to do so is through participatory experiment evaluation, wherein farmers are directly involved in developing, implementing and evaluating an experiment.

How do you know what to do?

The Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI) tested integrated crop management (ICM) and different rice varieties in the Ma Climate-Smart Village (CSV) of Yen Bai province, Vietnam. NOMAFSI used the participatory experiment evaluation approach, which helped the farmers discuss which practices and varieties would best suit the conditions in the village.

Fifty farmers from the different villages of the Vinh Kien commune joined a field workshop for assessing the ICM practices for rice production and participatory variety selection (PVS) on 25 May 2017. Staff members and officers from the Yen Bai Department of Agriculture and Rural Development, Yen Binh Division of Agriculture and Rural Development and the Vinh Kien Commune People Committee also participated in the activities.

The ICM trial focused on the following practices: use of healthy seedlings and varieties suitable to the local conditions, cultivation of rice in rows with fixed spaces in between, deep placement of fertilizers, and bio-mass recycling. These would reduce the adverse impacts on human health, as well as reduce labor costs related to fertilizer application.

The PQ and VD5 rice varieties were tested in the ICM trials. Developed and provided by the Institute of Asia-Pacific Science and Technology Research and Cooperation (IAP), these two varieties had been included in the PVS trials in 2016. The farmers in Ma evaluated these as "elite" because of their higher yields and tolerance to cold compared to other varieties. In addition, both varieties were also tender and had a nice aroma when cooked.

On the other hand, the farmers have been assessing different rice varieties through the PVS activities. Aside from PQ and VD5, six other rice varieties were evaluated based on their tolerance to cold and drought, and were also compared to the control variety. These were planted on eight

During the evaluation activity for the participatory variety selection in Ma Climate Smart-Village, Vietnam. Eight different rice varieties were assessed by the farmer participants during the field day.

Photo: Leo Sebastian (CCAFS)

different plots on one paddy field. The farmers and researchers from NOMAFSI then scored the varieties according to the listed criteria, based on their field observations.

The ICM trials were conducted under the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in Southeast Asia, while the PVS is one of the activities with the Consortium for Unfavorable Rice Environments (CURE).

How did the farmers find the experiment?

Many farmers who participated found ICM an appropriate climate-smart agriculture practice for their area. For them, the biggest benefit of using ICM was the consistency of the rice yield across the fields. ICM does mean, however, that farmers need to spend more time planning and caring for their plots.

Aside from tolerance to cold and drought, the rice varieties planted as part of the PVS trials were evaluated based on their uniformity, grain filling, number of grains per branch, rice quality, taste and smell. One stark difference was the height and apparent vigor of the stress-tolerant varieties, compared to those usually planted by the farmers. This would ensure better crop yields and higher incomes for smallholder farmers. Consumers would also benefit from these tolerant varieties which would be better in quality and nutritional content.

Discussions on the post-harvest processing of rice straw were held after the field evaluations. Farmers usually use herbicide to decompose the remaining rice straw on their fields, however this releases more chemicals into the environment. A biological decomposing agent, on the other hand, would take longer to break down the rice straw, but would also help retain and even build the organic matter in the soil, making it more fertile.

What happens next?

Of the 50 farmers who participated in the evaluation, 25 expressed their willingness to apply ICM practices for the next planting season. In conducting the PVS and the ICM trials, the farmers hope to enrich their pool of rice varieties and in time, improve their resilience to climate change and ensure long-term food security. Through participatory evaluation, farmers from neighboring villages can also learn more about climate-smart agriculture and help in upscaling the practices. Ms Dang Thi Thu, head of Dong Lam village, shared that she will be applying ICM in their own paddy field. She also wants to test the dibbling fertilizer with their winter maize crop. “I hope that farmers in my village will know more and apply more this technique to help increasing productivity, reducing input cost and help protecting the environment,” said Ms Dang during the activity.

Photo: Leo Sebastian (CCAFS)

Discussions after the field activities in Ma Climate-Smart Village, Vietnam. These helped determine whether farmers would like to adopt ICM practices.

Photo: Pham Nhu Trang (CIAT)

Vietnamese farmers demonstrating a vermiculture model.

Creating wealth from waste: Worms are worth the investment

by **Abigail Smith (World Agroforestry Centre)**

Vermiculture yields significant economic and ecological returns for a small initial investment.

My Loi, Vietnam - In a vermiculture system, worms decompose organic wastes to create a nutrient-rich compost fertilizer. These small but powerful recyclers accelerate the decomposition of organic matter into humus and can be used as poultry feed or sold.

Creating Wealth from Waste: Resource Use Efficiency in Climate-Smart Agriculture.

A new brief which assesses the diverse benefits associated with vermiculture, and showcases potential economic returns for farmers in the initial year of vermiculture establishment has been published. The integration of on-farm resource cycling is directly linked to cost savings, diversified income streams, and qualitative soil and crop improvements. Nutrient-rich vermicompost can be generated from waste and used as a soil amendment to improve soil structure, water filtration, and overall farm productivity. Inedible crop residues and livestock waste are recycled back into the system to reduce agricultural waste. The worms function as a supplemental protein and food source for poultry or a valuable product for farmers to sell. Integration of worms into the diets of the birds leads to faster growth, higher hatching rates, and improved overall health. This interconnected network of farm resources is directly linked with soil health, productivity, and system resiliency.

Vermiculture also has the potential to address each of the climate-smart agriculture (CSA) pillars:

Food security - increased agricultural productivity results from vermicompost soil enrichment, and worm sales can improve farmers' livelihoods;
Adaptation – vermicompost can improve soil moisture-holding capacity and reduce reliance on external inputs; and
Mitigation – vermicompost can serve as a replacement for fossil fuel-based fertilizers and reduce greenhouse gas emissions associated with raw manure application to fields.

With minimal initial investment and maintenance, vermiculture can improve the productivity and resiliency of small-scale farmers. Vermiculture has strong potential for wider adoption and scaling out as a climate-smart practice.

Info Note

Creating Wealth from Waste:
Resource Use Efficiency in Climate-Smart Agriculture

Findings from interviews with vermiculture farmers in Ha Tinh Province

Abigail Smith, Tam Thi Le

AUGUST 2017

Key messages

Overview

Vermiculture as a Climate-Smart Practice

Tam TL, Smith A. 2017. **Creating Wealth from Waste: Resource Use Efficiency in Climate-Smart Agriculture.** CCAFS Info Note. Wageningen, The Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Photo: Leo Sebastian (CCAFS)

Pest Smart interventions such as ecological engineering were introduced to the farmers in Tra Hat CSV. One of these interventions require planting nectar-rich flowers in their bunds to attract beneficial insects that can protect the crops.

Pest Smart interventions: Paving the way to pest and disease resilient rice farms

by **Camille Anne Mendizabal (World Agroforestry Centre)**

Farming communities in Tra Hat Climate-Smart Village (CSV) in Vietnam achieved enhanced pests and diseases (P&D) resilience through the adoption of ecological engineering practices and Plant Clinic consultations.

Many farmers in Vietnam and in countries across Southeast Asia depend on rice farming for livelihood and sustenance, as it is seen as a key crop in this region. Numerous climate-smart agriculture projects have already been implemented to help these farmers address the economic and abiotic problems causing yield losses. However, problems on P&D which accounts for 37% yield loss in rice farms have been dealt with to a lesser extent. This places livelihoods and food security of farmers, particularly in Tra Hat CSV, Bac Lieu province, Vietnam at a great risk.

Climate change aggravates farmers' problems on pests and diseases, for it can increase the uncertainties, frequency, and lengthen the duration of P&D occurrence on rice farms which is detrimental to farmer's yield. With lack of knowledge on managing P&D and weak agricultural extension systems, many farmers in the area resort to increasing use of chemical pesticides, believing that this ensures increase in yield and completely resolves the problem. Conversely, excessive use of pesticides creates more problems, as this leads to contamination of water sources, development of resistance to pesticides, and increased greenhouse gas emissions.

To address this problem, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) initiated the Pest Smart (PS) interventions with the goal of improving farmers' resilience to P&D and minimizing the loss in yield farmers incur.

Pest Smart interventions such as ecological engineering (EE), extension services such as Plant Clinic, and education and awareness raising activities were implemented in Tra Hat CSV. These interventions were created to convince farmers to plant nectar-rich flowers on their rice bunds to lessen their dependence on pesticides, provide free consultations with experts to solve farmers' P&D problems, and convince them to sustain these practices.

Dr. Sivapragasam, the Regional Director of Center for Agriculture and Biosciences International Southeast Asia (CABI-SEA), led the implementation of Pest-Smart activities which ran from September 2015 to November 2016. An assessment of the interventions' effects on the farmers' P&D management practices and attitudes were conducted through a pre-test survey done on July 2015 and a post-test survey held on November 2016.

Improved productivity for Pest Smart farmers

After 15 months of project implementation, the perceived yield loss caused by P&D has been reduced by 51%. Farmers' dry yield has increased from 6.9 t/ha to 7.8 t/ha. The interventions have also succeeded in changing farmers' pesticide spraying behaviour as shown by the reduced application of nitrogen fertilizer from 109.5 kg/ha to 93.3 kg/ha and reduced number of insecticide sprays to only 2.7 times per season.

The significant decline in the amount and frequency of fertilizer applications in majority of rice production stages are also indicators of the interventions' success despite the short period of implementation.

Education campaigns aimed to discourage farmers on spraying 40 days after sowing (DAS) were also effective to some extent, for the earliest pesticide spray recorded after the interventions have changed from 19 DAS to 33 DAS.

Embracing the interventions

Positive changes caused by PS activities were seen not only on farmers' practices, but also on their attitudes towards the interventions. For instance, many of the farmers now believe that planting nectar-rich flowers in their bunds attracts beneficial insects that can protect their crops. Fewer farmers believe that chemical pesticide is the most effective means of solving problems on pests.

Community leaders, civil society organizations, and local government officials benefitted from PS interventions. These stakeholders also gained knowledge and skills needed for supporting the development of farmers' resilience to P&D and establishing partnerships which will provide an enabling environment for the upscaling of these interventions.

Improving Sustainability

Sustaining the positive changes brought about by PS interventions entails continuation of the activities over a longer period of time. It is also important to overcome barriers in changing farmers' beliefs that pesticide use ensures increased yield, and in convincing them to avoid

Sivapragasam A, Chien HV, Khing SL, Duong LM. 2017. **Pest Smart interventions and their influence on farmer pest management practices in Tra Hat village, Bac Lieu Province, Vietnam. CCAFS** Working Paper no. 212. Wageningen, The Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

spraying within the first 40 days after sowing to ensure project sustainability.

Promotion of the application of EE practices on vegetable crops—which are supplementary sources of income and food, can be achieved through the provision of additional demo plots. Moreover, developing information materials that can comprehensively explain to farmers the interconnection of climate change, P&D, the use of pesticides, and the sustainability of agro-ecosystems can also help sustain and upscale PS interventions.

Photo: CABI

Local farmers of Tra Hat CSV visit Plant Clinic to learn about common pests, diseases and other problems affecting local crops.

Photo: Leo Sebastian (CCAFS)

In Vietnam, women farmers' needs and preferences affects how they receive, share, understand and act upon weather-related information. Learning about the gender dimension of communicating agro-climatic information is a must.

Considering gender-differences: The key to effective agro-climatic advisories

by **Eisen Bernardo** (CCAFS Southeast Asia)

The needs and preferences of women and men farmers must be considered in order to disseminate agro-climate information effectively.

Women are more vulnerable to the impacts of climate change. In many cultures, men farmers can access agro-climatic information more easily than women, which constrains women's participation in decision making at various levels.

To enable women farmers, ethnic minority farmers, and agricultural planners to better anticipate and respond to risks and opportunities from changes in weather patterns, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) implemented the Agro-Climate Information Services for women and ethnic minority farmers in Southeast Asia (ACIS) project. Led by the World Agroforestry Centre (ICRAF) and CARE International, the project provides practical agro-climatic information and guidance, with particular attention given to the unique gendered aspects of disseminating this information, in Vietnam, Lao PDR, and Cambodia from 2015 to 2018.

As part of the ACIS project, a new brief was published to elaborate on the gender-differences in agro-climatic information services. It summarizes the baseline survey and the testing of different agro-advisories conducted in ACIS projects sites in Dien Bien and Ha Tinh provinces, Vietnam. The survey gathered information on diverse aspects of livelihoods, food security, climate hazards and impacts, as well as access to and quality of weather and agricultural information. A total of 595 farmers (180 women and 139 men, of which 90% are ethnic minority farmers in Dien Bien and 134 women and 142 men with less than 2% are ethnic minority farmers in Ha Tinh) were interviewed using a baseline survey questionnaire conducted in December 2015.

Based on the survey, women and men face unique challenges in terms of domestic labor which impact their participation in agricultural production activities. Women and men differ in a range of aspects from agricultural responsibilities and decision-making to market engagement. Also, women and men perceive some weather impacts on crops differently and diverge in how they receive, share, understand, and act upon weather-related information.

The other half of the brief discusses the testing of different agro-advisories developed in the ACIS project. In June 2017, the team conducted a survey at a Participatory Scenario Planning (PSP) meeting to test the six samples of the

agro-advisory developed. Men and women farmers were separated into two groups of 10 each and asked to rank the agro-advisories based on the following criteria: (i) easy to understand; (ii) provides useful information; (iii) provides appropriate and necessary information; and (iv) takes time to read.

Results show that women and men had similar preferences for how the agro-advisory information was presented based on the six samples prepared in the study. These group preferences help informing the final design of agro-advisory information tools to maximize understanding and facilitate action. The process requires continual revision and testing to ensure actionable information addresses the needs of stakeholder groups.

Intra-household information sharing can be improved by understanding the gender dimension of labor distribution, information dissemination, and collaboration. The study reinforces the idea that gender factors must be integrated into project design, policy formulation, and implementation at all levels.

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security CCAFS

Info Note

Gender-differences in Agro-Climate Information Services

Findings from ACIS baseline survey in Ha Tinh and Dien Bien provinces, Vietnam

Tuan Minh Duong, Abigail Smith, Tam Thi Le, Elisabeth Simelton, Miguel Coulier

SEPTEMBER 2017

Key messages

- Women and men face unique challenges in terms of domestic labor which impact their participation in agricultural production activities.
- Women and men differ in a range of aspects from agricultural responsibilities and decision making to market engagement.
- Women and men perceive some weather impacts on crops differently and diverge in how they receive, share, understand, and act upon weather-related information.
- Equal opportunities to communicate needs and participate in agro-advisory designs can make the information more actionable for both genders
- Intra-household sharing of weather information can be improved by updated agro-advisory designs.

Some studies show that women and men are impacted by climate change differently due to social and economic distinctions. Constraints may exist in terms of institutional participation, information access, capital, mobility, education and asset ownership [1]. In many cultures, men farmers can access information more easily, which constrains women's participation in decision making at various levels [2].

Overview

The Agro-Climate Information Services for women and ethnic minority farmers in South-East Asia (ACIS) is a project implemented by ICRAF and CARE International in cooperation with local partners in Vietnam, Lao PDR, and Cambodia from 2015 to 2018. By providing practical agro-climatic information and guidance, ACIS will enable women farmers, ethnic minority farmers, and agricultural planners in three countries to better anticipate and respond to risks and opportunities from changes in weather patterns, with particular attention given to the unique gendered aspects of disseminating this information [3].

This brief summarizes first, the gender-related information of a baseline survey conducted in the two Vietnam project sites: Dien Bien and Ha Tinh provinces. The survey gathered information on diverse aspects of livelihoods, food security, climate hazards and impacts, as well as access to and quality of weather and agricultural information. A total of 595 farmers (180 women and 139 men, of which 90% are ethnic minority farmers in Dien Bien and 134 women/142 men with less than 2% are ethnic minority farmers in Ha Tinh) were interviewed using a baseline survey questionnaire conducted in December 2015 [4].

Second, later into the project, in June 2017, the team conducted a survey at a Participatory Scenario Planning (PSP) meeting to follow up on the agro-advisories developed in the project. Men and women farmers were separated into two groups of 10 each and asked to rank six samples of the agro-advisory. The ranking scale ranged from 1 for 'strongly disagree' to 5 for 'strongly agree' about the following statements for each sample: (i) easy to understand; (ii) provides useful information; (iii) provides appropriate and necessary information; and (iv) takes time to read.

Results

The first section covers three themes from the baseline survey in 2015: *Labor* – identifying the intra-household gendered division of tasks in both domestic work and agricultural production; *Perception* – the differences and similarities in terms of how men and women interpret climate impacts; *Adaptation* – responses to changes in climatic patterns and extreme weather events; Information sharing – the use and exchange of information. The second part presents the farmers' preferences for the agro-advisory designs in 2017.

CCAFS INFO NOTE 1

Duong MT, Smith A, Le TT, Simelton E, Coulier M. 2017. **Gender-differences in Agro-Climate Information Services (Findings from ACIS baseline survey in Ha Tinh and Dien Bien provinces, Vietnam).** CCAFS Info Note. Wageningen, The Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Photo: Tuan Minh Duong (ICRAF)

In a Participatory Scenario Planning (PSP) meeting, a survey was conducted to test the six samples of the agro-advisory developed in the ACIS project.

Photo: Cao Le Quyen (CCAFS)

Farmers harvesting tilapia in an integrated farming system in Tanh Hoa province in North and North Central Coast of Vietnam.

More Vietnamese households adopt integrated aquaculture systems as a climate-smart practice

by **Camille Anne Mendizabal (World Agroforestry Centre)**

Coastal communities are learning about the benefits of climate-smart aquaculture and integrated coastal farming systems. More quantitative evidence of these practices is now being documented.

Many coastal communities in Vietnam's North and North Central Coast (NNCC), one of the poorest regions in the country, rely on coastal aquaculture, particularly integrated aquaculture farming systems for their livelihoods and sustenance. However, climate change and its impacts have negatively affected coastal aquaculture recently by increasing the risks of disease outbreaks and crop failures.

For example, tiger shrimp, the major culture species of many farms in the NNCC, are sensitive to changes in the climate and the environment, such as the salinity level of the water. The shrimp crops are at high risk for failure when the salinity level of cultured pond drops below five parts per thousand (ppt). For farmers, depending solely on one type of crop could therefore be disastrous, especially in the context of increased extreme weather events. Integrated aquaculture systems ensure farmers have more diverse crops on which to depend and earn stable income to enhance their adaptive and resilient capacity to cope with climate change impacts.

In 2015, a project in Hoang Phong commune in Thanh Hoa province began to support aquaculture farmers in improving their farming practices, especially in the light of coping with climate change. The project is called 'Enhancing community resilience to climate change by promoting smart aquaculture management practices along the coastal areas of North Central Vietnam (ECO-SAMP),' and it is supported by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). It is implemented by WorldFish, the Vietnam Institute for Fisheries Economics and Planning (VIFEP) and Thanh Hoa Agriculture Extension Centre.

On-farm research on climate-smart aquaculture practices, specifically raising mono-sex tilapia with tiger shrimp, mud crabs and seaweed, has been conducted over the two-year project duration. The team has been documenting quantitative evidence of the performance and the scaling out of the tested practices in the region.

Reaping what they sow

During the first year of the project, five households participated as a trial model for the integrated farming system. Farmers grew mono-sex tilapia as these could withstand salinity levels of up to 15 ppt. Aside from high salinity tolerance, these fish could also help farmers save money on cleaning their ponds, as well as being more economically viable due to their larger size. These five households increased to 40 in 2016 in Hoang Phong commune (Hoang Hoa coastal district).

Owing to the positive results of the trials, 122 local farmers from Hoang Hoa, Nga Son, Hau

Loc, and Quang Xuong coastal districts have also adopted this farming system on their own accord.

This is encouraging, as the researchers found that this particular farming system could increase household incomes above 12%. Due to reduced pond cleaning, farmers saved VND 7 million, which is equivalent to 46 labor days.

Research also showed that farmers in NNCC of Vietnam can integrate other cultured species like fiddler crabs or sea worm (Tylorrhynchus heterocheatus) with rice in estuary fields. Brackish water fishes in coastal lagoons such as orange spotted spinefoot fish (Siganus guttatus) (Cá dìa) and Siganus canaloculatu fish (Cá Kình) can also be integrated in similar systems.

The adoption of such climate-smart aquaculture practices has diversified farmers' aquaculture production and improved their capacities in purchasing and accumulating family assets. This has also increased women's incomes and enhanced gender equity.

Prospects for scaling out

Based on the assessment on potential for scaling out, six out of 11 NNCC provinces, with a total potential acreage of about 13,780 hectares, are now targeted. Several social, institutional, technological, and financial barriers, however, still need to be addressed to push through with the upscaling plan.

With more farmers adopting these aquaculture production systems, the team has been shifting the project focus in 2017 to institutional barriers, especially aquaculture value chain structure and its coordination mechanisms for successful scaling out of the proven CSA practices.

Widespread adoption of climate-smart aquaculture techniques also entails building infrastructures to enhance farm-to-market access; improving credit and insurance systems so that farmers can afford their transition to climate-smart aquaculture; and providing an enabling environment for knowledge sharing and capacity development.

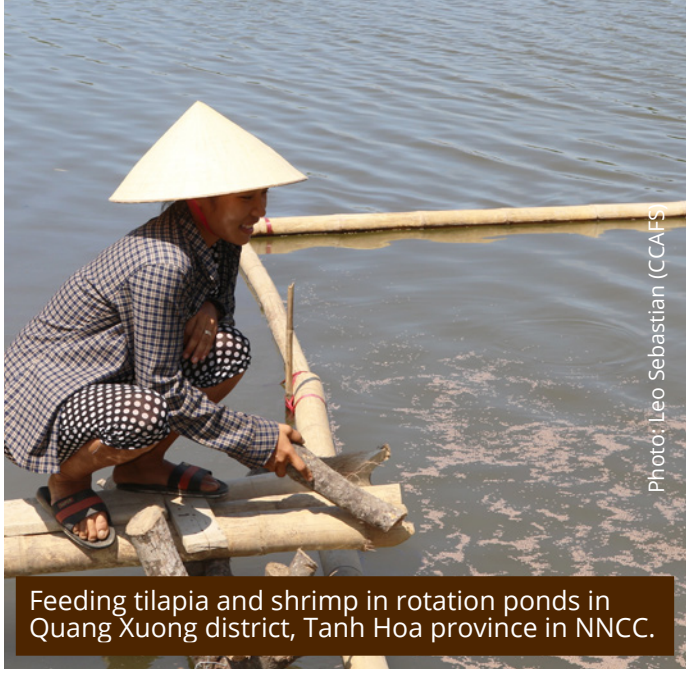
Photo: Leo Sebastian (CCAFS)

Feeding tilapia and shrimp in rotation ponds in Quang Xuong district, Tanh Hoa province in NNCC.

The farmers who were first involved would be qualified to train farmers in other provinces in the NNCC on CSAq techniques of integrated farming systems. To harness this potential, both climate-smart aquaculture farmer groups and researchers should establish close partnerships with the private sector for input supplies and product marketing.

As of now, Thanh Hoa Investment and Agriculture Development NT Joint-Stock Company, a local private company, also joined the project to supply necessary quality inputs (seeds, feeds, and other bio-chemical products) and for marketing their products.

The project's assessment of the CSA interventions would help the farmers and other stakeholders understand the impacts and performance of these practices. Areas, such as coastal communities on the Mekong River Delta, southern Vietnam, could also benefit and learn from the results of the assessment.


Photo: Nhuong Tran (CCAFS)

Rice and shrimp aquaculture in My Xuyen, Soc Trang Province in the Mekong Delta of Vietnam.

Photo: Leo Sebastian (CCAFS)

Workshop participants visited a community rice production in Battambang Province, Cambodia.

Beyond the village:Upscaling climate-smart agriculture in Southeast Asia

by **Amy Cruz (World Agroforestry Centre (ICRAF) and CCAFS Southeast Asia)**

A roving workshop in Cambodia facilitated cross-learning among local leaders in Southeast Asia and prepare for the upscaling of climate-smart practices.

Making communities climate-smart involves not only just increasing communities' awareness of climate change. Local leaders and communities should also know the specifics of each practice and how these could help in their own contexts. The CGIAR Research Program on Climate Change, Agriculture and Food Security in Southeast Asia (CCAFS SEA) organized the third roving workshop for local and farmer leaders from the Climate-Smart Villages (CSVs) in SEA. This was held in Cambodia from 14-18 August 2017.

Photo: Leo Sebastian (CCAFS)

After the field visits, the participants had synthesis and reflection sessions to process their learnings.

Aside from enhancing the participants' knowledge on climate-smart agriculture (CSA), the workshop also facilitated cross-learning between communities and prepare them for bringing appropriate practices to scale.

"In the roving workshop, we engaged local leaders beyond the CSVs as possible advocates for upscaling. The workshop exposed them to different options for making their communities climate-smart," says Dr Leocadio Sebastian, regional program leader of CCAFS SEA.

The participants were 26 local leaders from the CSVs (Ma, My Loi and Tra Hat in Vietnam; Phailom and Ekxang in Laos; Rohal Suong in Cambodia; and Guinayangan in the Philippines), communes and districts where the CSVs are located. Also included are interpreters for the Vietnamese and Laotian participants, and researchers from CCAFS SEA and WorldFish, the lead center for the Cambodian CSV.

Participants visited the Rohal Suong CSV and other project areas for CSA, where they interacted with people from the communities and other implementers of climate-smart practices. After these field visits, the participants also had synthesis and reflection sessions to process their learnings. Their respective best practices and updates on the outcomes of previous workshops were shared.

Two other roving workshops have already been held in the Philippines and Vietnam. Farmers from Southeast Asian CSVs first visited the municipality of Guinayangan, Philippines last 8 - 17 September 2015. The second workshop was held from 22 to 28 May 2016 in Vietnam.

PhotoNews

IRRI is supporting the Vietnam Sustainable Agricultural Transformation (VnSAT) project in the institutional strengthening of the agriculture sector, promoting sustainable farm practices, and improving rice value chains in Mekong Delta of Vietnam. IRRI experts will provide technical assistance and capacity building activities to various stakeholders such as the local government agencies, agribusinesses, and farmer's organizations. Mr. Le Van Hien, Director of CPMU Vn-SAT, and Dr. Leocadio Sebastian, IRRI Representative in Vietnam, led the contract signing ceremony on 20 July 2017 in Hanoi, Vietnam.

Dr. Bruce Tolentino, deputy director general for communication of the International Rice Research Institute, shared some options for hi-tech rice production during the Conference on High Quality and Sustainable Agricultural Development in Vietnam. The conference is part of the 2017 Vietnam Economic Forum, organized by the Central Economic Commission and the Australian Embassy, held on 27 June 2017 at the Melia Hotel, Hanoi, Vietnam.

Masters of Science in Climate Change, Agriculture and Food Security (CCAFS MSc) students from the National University of Ireland in Galway presented their internship outputs to the officials of Irish Aid, Embassy of Ireland in Hanoi. John Cleary, hosted by SEA RPL and ICRAF, worked on "Photovoice" in My Loi CSV in Vietnam, while Orla O'Halloran, hosted by CIAT Vietnam, worked on perceptions of CSA in the coffee sector.

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NOTES

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