RICE LANDSCAPES AND CLIMATE CHANGE

Options for mitigation in rice-based agroecosystems and Scaling-up of climate-smart rice cultivation technologies in Asia

Workshop Report
10-12 October 2018
RICE LANDSCAPES AND CLIMATE CHANGE

Options for mitigation in rice-based agroecosystems and scaling-up of climate-smart rice cultivation technologies in Asia

OCTOBER 10-12, 2018 | BANGKOK, THAILAND

WORKSHOP REPORT

Prepared by: Beau Damen, Srijita Dasgupta, Tristan Rousset and Yim Yu
Stephanie Kong

Cover photo: ©FAO/A.K. Kimoto
# Contents

Acronyms ................................................................................................................................. 1

Executive summary ..................................................................................................................... 2

Background .................................................................................................................................. 5

Significance of the Paris Agreement for agriculture and measures for mitigation and adaptation in rice landscapes .............................................................................................................. 7

Baseline situation for actions in climate change in rice landscapes ................................................. 10

Country experiences in reducing emissions and increasing resilience in rice landscapes ............. 11

Current initiatives and activities in the region on reducing emissions and increasing resilience ....... 18

Climate Smart Rice Cultivation in Asia .......................................................................................... 24

Developing a rice climate action plan .......................................................................................... 28

Driving investment in climate smart landscapes and the role of the private sector ......................... 30

Promoting and scaling-up sustainable rice landscapes .................................................................... 32

Sustainable Rice Landscape – Developing a Regional Initiative .................................................... 34

Annex 1 Agenda .......................................................................................................................... 36

Annex 2 Climate-smart Sustainable Rice Landscapes Project Concept ............................................ 40

Annex 3 Participants List ............................................................................................................... 49
# Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEGIS</td>
<td>The Action on Emission of GHGs for Integrated Sustainability (AEGIS)</td>
</tr>
<tr>
<td>APEC</td>
<td>Asia Pacific Economic Cooperation</td>
</tr>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
</tr>
<tr>
<td>ASEAN CRN</td>
<td>ASEAN Climate Resilience Network</td>
</tr>
<tr>
<td>ASP</td>
<td>Asia Soil Partnership</td>
</tr>
<tr>
<td>AWD</td>
<td>Alternate Wetting and Drying technology for rice production</td>
</tr>
<tr>
<td>CBIT</td>
<td>Paris Agreement Capacity-Building Initiative for Transparency</td>
</tr>
<tr>
<td>CC</td>
<td>Climate Change</td>
</tr>
<tr>
<td>CF</td>
<td>Continuous Flooding</td>
</tr>
<tr>
<td>CH4</td>
<td>Methane</td>
</tr>
<tr>
<td>CSA</td>
<td>Climate-smart Agriculture</td>
</tr>
<tr>
<td>EDF</td>
<td>Environmental Defense Fund</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>FFS</td>
<td>Farmer Field School</td>
</tr>
<tr>
<td>GCF</td>
<td>Global Climate Fund</td>
</tr>
<tr>
<td>GEF</td>
<td>Global Environment Facility</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gasses</td>
</tr>
<tr>
<td>GRA</td>
<td>Global Research Alliance on Agricultural Greenhouse</td>
</tr>
<tr>
<td>GSP</td>
<td>Global Soil Partnership</td>
</tr>
<tr>
<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
</tr>
<tr>
<td>IRFF</td>
<td>Integrated rice-fish farming</td>
</tr>
<tr>
<td>IRRI</td>
<td>International Rice Research Institute</td>
</tr>
<tr>
<td>JIRCAS</td>
<td>Japan International Research Center for Agricultural Sciences</td>
</tr>
<tr>
<td>N2O</td>
<td>Nitrous Oxide</td>
</tr>
<tr>
<td>MAFF</td>
<td>Ministry of Agriculture, Forestry and Fisheries, Japan</td>
</tr>
<tr>
<td>NARO</td>
<td>National Agriculture and Food Research Organization</td>
</tr>
<tr>
<td>MRV</td>
<td>Monitoring, Reporting and Verification</td>
</tr>
<tr>
<td>NDCs</td>
<td>Nationally determined contributions</td>
</tr>
<tr>
<td>PA</td>
<td>Paris Agreement</td>
</tr>
<tr>
<td>PPP</td>
<td>Public-private partnerships</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SMEs</td>
<td>Small and medium-sized enterprises</td>
</tr>
<tr>
<td>SOC</td>
<td>Soil Organic Carbon</td>
</tr>
<tr>
<td>SRP</td>
<td>Sustainable Rice Platform</td>
</tr>
<tr>
<td>UNFCCC</td>
<td>United Nations Framework on Climate Change Convention</td>
</tr>
<tr>
<td>WBCSD</td>
<td>World Business Council for Sustainable Development</td>
</tr>
</tbody>
</table>
Executive summary

This report summarizes the proceedings of a regional workshop on “Rice Landscapes and Climate Change: options for mitigation in rice-based agroecosystems and the scaling-up of climate-smart rice cultivation technologies in Asia.” The workshop brought together more than a hundred participants from Ministries of Agriculture and Environment and Agricultural Research Agencies from countries in Asia as well as development and private sector organizations.

Participants left the workshop with an enhanced understanding of the implications of the Paris Agreement and the importance and relevance of climate-smart rice cultivation practices for increasing resilience, reducing GHG emissions and storing carbon in rice ecosystems. Knowledge sessions on the global policy context for climate action were followed with technical sessions on a range of ongoing research and technical advisory initiatives related to rice production systems and climate change. A special session on capacity building provided practically oriented examples and information to apply and scale-up measures related to climate-smart rice production practices. Later participants engaged with representatives from the private sector and donors to discuss how public and private partnership and investment can help to scale-up climate smart-rice production systems and landscape-based approaches linked to national goals for adaptation and mitigation in agriculture.

Participants also engaged in a series of interactive sessions to help apply the lessons learned during the workshop sessions. Country participants identified baseline scenarios for action in the rice sector and more generally on climate change in the agriculture sector. They also identified strategies and actions required for reducing emissions and increasing resilience in rice landscapes at the national and regional level in support of a Rice Climate Action Plan. Finally each country groups developed short project concepts on Climate Smart Sustainable Rice Landscapes.

Takeaway Messages

- Despite ongoing structural changes and regional trends toward the consumption of livestock products, fish, fruits and vegetables, rice will remain a key driver of growth in the agricultural sector at least for the next decade.

- While productivity growth in the sector has flattened over the past decade, there is potential to improve sustainability through innovation and the smart application of best practices incorporating local knowledge and new technology.

- Procurement practices in global value chains, if oriented towards sustainability, may be able to positively influence production practices on-farm.

- The projected impacts of climate change could result in significant declines in rice yield and higher prices. Rice also contributes as much as 10.7% of the region’s emissions.

- Several mitigation technologies have been developed to help to reduce emissions from rice fields, while also maintaining agricultural productivity and reducing negative impacts on rice agroecosystems and food security.

- Adaptation is a key priority for countries in Southeast Asia under the Paris Agreement. Countries are also actively working towards and/or considering mitigation targets for the agriculture sectors including rice.
• National research agencies are actively investigating new practices and technologies to increase the resilience and reduce emissions from rice production systems.

• Successful application of these measures at scale requires support in terms of technical advice, extension and access to new materials and infrastructure.

• At the regional level, international and national research and technical agencies are implementing initiatives that aim to address gaps and needs associated with the transfer of more sustainable rice production technologies and practices that can deliver resilience and mitigation benefits.

• Climate-smart rice production technologies and practices aim to both increase the resilience of rice production systems to climate change and reduce emissions, while maintaining productivity and farmer livelihoods.

• A number of climate-smart practices have been applied in countries around the region providing examples and best practices that can be adopted at larger scales.

• Climate-smart practices need to account for the interests of a range of stakeholders and account for ecosystem health and function.

• Establishing effective systems for monitoring implementation of climate-smart practices is crucial for ensuring that their adoption will contribute to the achievement of environmental goals, while maintaining farm productivity.

• The private sector involves a wide variety of actors that require a tailored business case to support investment in sustainable approaches. The private sector will only engage in climate smart agriculture if it has an impact on its balance sheet.

• The case for investment in climate smart agriculture can be further complicated because the visions of the public and private sectors are often not aligned. Increased interaction between interaction between public and private sector stakeholders will help to overcome barriers and identify viable ways to collaborate to promote climate smart agriculture.

• Public incentives are crucial for unlocking private sector investment in climate smart rice production. The regulatory and policy environment should recognize, promote and reward public-private partnerships that target these types of more sustainable approaches.

• Rice is not traditionally considered a crop with high potential for price premiums linked to higher levels of quality or sustainability. However, private sector involvement in the design of sustainability standards and indicators can act as a catalyst for private sector action and more conducive policies.

• Rice production systems are interlinked with different elements of the landscape and these need to be accounted for when looking to generate positive spillovers associated with sustainability, equity and resilience.

• Public climate finance, while only a small portion of overall climate finance, finance can be an important catalyst for climate action; particularly where solutions to climate change
challenges involve common resources and public goods or require additional incentive to promote adoption and scale-up.

- Two key sources of climate finance, the Green Climate Fund and the Global Environment Facility, are looking to support projects that can transform agricultural production systems in ways that enhance sustainability, reduce emissions and increase resilience.

- These funds may present viable platforms for private and public stakeholders looking to promote climate smart rice production systems to pursue partnerships to invest in and scale-up these systems in the region.
Background

The agriculture sector is facing the dual challenge of increasing food production to meet consumer demands, while trying to adapt to a changing climate. Rapidly fluctuating global temperatures, uncertainties in precipitation patterns, and increasing intensity and frequency of natural disasters are major threats to food systems that are likely to constrain productivity and disrupt the stability of food systems. At the same time, agriculture and food systems are a key source of greenhouse gas emissions. Addressing this challenges requires consideration of sector and crop specific opportunities and trade-offs.

In acknowledgement of the challenges and opportunities that tackling climate change presents for the agriculture sectors, agriculture and land-use sectors, comprising crops, livestock, fisheries, aquaculture and forestry, feature prominently in country commitments from Asia under the Paris Agreement. Many countries in the region have specifically highlighted adaptation and mitigation measures in rice landscapes as priority actions for investment and scaling-up.

In Asia, rice is a defining element of the region’s agroecosystem systems and a crucial staple food and cash crop. Rice, a thirsty crop, is sensitive to changes in climate that limit the availability of water. Declines in yield can be triggered where temperatures exceed certain thresholds at key stages during the plants development. Projected climate change in the region including increases in average and specific temperatures as well as more variable precipitation and changes in water flow regimes resulting from climate and other impacts on the region’s freshwater systems necessitate the early identification and scaling-up of viable adaptation options. Rice fields are also a major source of methane emissions.

A range of approaches and technologies have been developed to help to reduce emissions from rice fields, while also maintaining agricultural productivity and reducing negative impacts on rice agroecosystems and food security. Gaps in capacities, particularly access to scientific knowledge and data for accurate estimation of GHG emissions and sequestration, in rice paddy fields are a key barrier to the scaling-up of climate-smart rice cultivation approaches and technologies.

To investigate these issues in more detail, the FAO Regional Office for Asia and the Pacific (FAORAP) in collaboration with Asia Pacific Economic Cooperation (APEC), the Joint Graduate School of Energy and Environment at King Mongkut’s University of Technology Thonburi (JGSEE/KMUTT), the ASEAN Climate Resilience Network, the National Agriculture and Food Research Organization (NARO), and the Global Research Alliance on Agricultural Greenhouse Gases (GRA), GIZ, the Sustainable Rice Platform (SRP), the International Rice Research Institute (IRRI) and the support of the Ministry of Agriculture, Forestry and Fisheries, Japan (MAFF), and the World Business Council for Sustainable Development (WBCSD) organized a regional workshop on “Rice Landscapes and Climate Change: Options for GHG emissions reduction from rice agroecosystems and climate-smart rice cultivation technologies in Asia” in Bangkok, Thailand in October 2018.

The purpose of the workshop was to strengthen capacity of countries in to identify viable options for mitigation and adaptation in rice landscapes and develop strategies to scale-up climate-smart rice cultivation technologies in support of national NDC goals and targets under the Paris Agreement.

The workshop was targeted primarily at countries in Southeast Asia under the FAO regional initiative on “Healthy Soil” management for Combating Climate Change in Southeast Asia” and the APEC project on “Capacity Building on Management Technologies for climate smart rice cultivation in the South-East Asian and Latin American Rice Sector”. Over 100 people from Ministries of Agriculture and Environment,
Agricultural Research Agencies, NGOs, research organizations, educational institutes and international development organizations attended. A full participants list is provided at Annex 3.

**Workshop Opening**
The workshop was opened by Xiangjun Yao, FAO’s Regional Programme Leader for Asia and the Pacific, and Mr Ichiro Nakagawa, Director of the Environment Office, Ministry of Agriculture, Forestry and Fisheries of Japan. The speakers welcomed the participants and thanked project partners for their funding and in-kind contributions to the programme as well as their cooperation to the successful organization of the workshop.

It was noted that improvements in rice productivity over the past decades have contributed to tackling hunger and agriculture-led broad based economic growth has been key to lessening poverty and rapidly decreasing malnutrition among the poor in rural areas. But these gains had not come without costs such as pollution and land degradation. Rice is a key source of emissions from the agriculture sector in the region and a driver of climate change and associated impacts including rising temperatures, more variable precipitation and extreme weather.

Both speakers highlighted that urgent action is needed to both adapt rice production systems to near-term and future climate variability and change, while also mitigating emissions where feasible to prevent further global warming. While tradeoffs are to be carefully assessed and managed, numerous opportunities exist to scale-up climate-smart approaches in rice landscape. Countries from the region had acknowledged these challenges under the Paris Agreement with many identifying specific adaptation and mitigation measures to be scaled-up as part of their Nationally Determined Contributions (NDC’s). Mr Nakagawa cited the examples of at MAFF Japan’s “Plan for Global Warming Countermeasures” and the “Climate Change Adaptation Act” as measures being taken by the Japanese Government and business at national and local levels to tackle climate change impacts and to reduce GHG emissions.

Both speakers highlighted that partnerships between government, technical partners, financial institutions, farmers and private agribusinesses will lead to workable solutions and investment in climate-smart rice landscapes at a large scale. They expressed their hope that the knowledge acquired by the participants during the workshop will be brought back to their respective countries and organizations and will be utilized to develop NDC’s and more efficiently combat climate change.
Significance of the Paris Agreement for agriculture and measures for mitigation and adaptation in rice landscapes

This session aimed to provide a summary of key ideas required for understanding the implications of the Paris Agreement for the agriculture sectors and the importance and relevance of reducing GHG emissions from rice ecosystems through sustainable soil management initiatives.

Speakers
Beau Damen
Natural Resources Officer
FAO

Dr. Sirintornthep Towprayoon
Associate Professor
King Mongkut’ University of Technology

Agriculture trends in the region
Significant progress has been made in reducing the prevalence of hunger in Southeast Asia over the past few decades. This progress has been driven primarily by growth in income resulting from structural shifts in economies around the region towards industry and service sectors. However, agriculture is still a significant source of employment and economic development in Southeast Asia. The consumption of rice and other staples has declined in relative terms due to increased consumption of livestock products, fish, fruits and vegetables as well as processed and convenience foods. Despite these trends, rice will remain a key driver of growth in the agricultural sector at least for the next decade.

While productivity growth in the sector has flattened over the past decade, there is potential to improve sustainability though innovation and the smart application of best practices incorporating local knowledge and new technology. Current public and private investment in research and development is currently insufficient to help the next generation of farmers develop management strategies that will maintain and enhance productivity while also addressing environmental constraints such as climate change. International trade could also be a potential source of innovation and driver for sustainability.
Procurement practices in global value chains, if oriented towards sustainability, may be able to positively influence production practices on-farm. Farmers in Southeast Asia are comparatively well integrated into global commodity value chains for oils, livestock, and grains; particularly rice. The enabling institutional and policy environment for sustainable agriculture differs considerably across countries in the region. Efforts to strengthen research and development, farmers access to finance, agricultural and rural infrastructure and environmental standards could bring benefits in terms of productivity and sustainability in the region.

Climate change, agriculture and the Paris Agreement
The OECD estimates that projected climate change in Southeast Asia could reduce rice yields by 16% and 17% for non-irrigated and irrigated rice respectively on average leading to price increases of up 50% by 2050. Adaptation is a key priority for countries in Southeast Asia under the Paris Agreement. Countries have identified key areas of common technical focus relevant to rice production in their National Determined Contributions (NDCs) including improved water management and the development of new, more resilient crop varieties.

Rice fields also contribute as much as 10.7% of the region’s emissions from the agriculture sectors. A number of technologies and practices are being deployed across the region to try and address emissions from rice production including:

- **Rotation crop** cultivation has been shown to reduce CH4 emission from rice field by 40 to 45% although this practice tends to increase N2O emissions.
- **Biochar** application can lead to a reduction of CH4 emissions by 10-60 % depending on the type of soil.
- **Multiple drainage** reduces CH4 emissions by approximately 49%, however N2O emissions tend to increase with this method.
- **Alternate Wetting and Drying (AWD)** is widely accepted as the most promising practice for reducing GHG emissions from irrigated rice, reducing water usage by 30%, fuel use by 30% and CH4 emissions by 40% on average.
- Application of **Tailor-made fertilizer** based on soil testing can reduce fertilizer cost by 21%, and increase crop yield by 15%.
- **System of rice intensification (SRI)** has been shown to improve rice yield, reduce fuel consumption and can reduce water consumption by 19-64% compared to conventional rice cultivation techniques.

At present, only Vietnam and Indonesia have clearly defined actions to reduce emissions and set clear reduction targets within their NDCs. Countries ability to access support for scaling-up climate change action in support of their NDCs may be related to their ability to demonstrate ambition and articulate needs and capacity gaps. During the discussion session, Thailand, the Philippines and Cambodia indicated that they are assessing the potential to include mitigation targets for agriculture in the next revision of their respective NDC’s. There may be advantages for an integrated, regional approach to future engagement with negotiations linked to the Paris Agreement and agriculture to highlight shared priorities and harmonize approaches for scaling-up and monitoring adaptation and mitigation.
Takeaway messages

- Despite ongoing structural changes and regional trends toward the consumption of livestock products, fish, fruits and vegetables, rice will remain a key driver of growth in the agricultural sector at least for the next decade.

- While productivity growth in the sector has flattened over the past decade, there is potential to improve sustainability though innovation and the smart application of best practices incorporating local knowledge and new technology.

- Procurement practices in global value chains, if oriented towards sustainability, may be able to positively influence production practices on-farm.

- The projected impacts of climate change could result in significant declines in rice yield and higher prices. Rice also contributes as much as 10.7% of the region’s emissions.

- Several mitigation technologies have been developed to help to reduce emissions from rice fields, while also maintaining agricultural productivity and reducing negative impacts on rice agroecosystems and food security.

- Adaptation is a key priority for countries in Southeast Asia under the Paris Agreement. Countries are also actively working towards and/or considering mitigation targets for the agriculture sectors including rice.
Baseline situation for actions in climate change in rice landscapes

During this session participants worked in country groups to identify and report on the policies and institutions for the rice sector and consider how they relate to broader national policies on climate change and their respective NDC goals and targets. The country groups also identified and described the key rice agroecosystems in their countries as well as climate change risks.

The aim of the exercise was to highlight the variety of institutions and policies in place to support the agriculture and rice production sectors address challenges associated with climate change. The exercise also helped to identify the wide range of stakeholders at national levels engaged in climate change actions within the context of agriculture and rice production.

The outputs of this session can be found at this link.
Country experiences in reducing emissions and increasing resilience in rice landscapes

Representatives from country agricultural research agencies presented recent experience and ongoing research initiatives for reducing emissions and increasing resilience in rice landscapes. The session highlighted country specific examples of technologies and practices that may be relevant for other countries in the region.

Below is a concise summary of the posters showcased during the workshop. The full case study posters can be found at this link.
### The Philippines

**Rice Crop Manager: Decision-Support Tool for Increasing Productivity, Profitability and Reducing GHG Emission in the Philippines**

**Authors:**
Wilfredo B. Collado, PhilRice
Kristine S. Pascual, PhilRice
U-Nichols A, DA
Vilma V. Garcia, DENR Region 3

This case study focused on the nationwide implementation of precision farming by providing rice farmers with personalized crop and nutrient management recommendations called ‘Rice Crop Manager’. The RCM technology has been embedded into national rice programs like the “High-Yield Technology Adoption Program” and the “Philippine Rice Roadmap Development Plan 2018-2022. The RCM is applied in the field with the assistance of an extension officer. Application of the technology and associated practices has led to improved yields and incomes for farmers. Research by PhilRice and IRRI has also indicated that use of the RCM has led to increased N-use efficiency and reduced CH₄ emissions when applied in combination with AWD.

### Myanmar

**Improving the Efficiency of Nitrogen Cycle Management in Rice Cropping System in the Central Myanmar**

**Authors:**
War War Thein, Department of Agriculture

This case study focused on biochar application to minimize environmental risks, while enhancing food security and food safety, resiliency of farming systems to climate change, and enhanced market connectivity for farmers. The research aimed to address the poor availability of and application of fertilizer and high N₂O emissions from rice fields. The research indicates that application of biochar led to improved yields and reduced emissions N₂O when compared to fields where only chemical nitrogen fertilizers were applied.
**RICE FISH – Managing Water and Soil for Climate Change Adaptation**

**Authors:**
Arief Lukman Hakim, FIELD Indonesia

This case study focused on the use of rice–fish farming and FAO Save and Grow Farmer Field Schools in Indramayu, West Java to address issues associated with climate variability and change. Farmers were guided in the use of a number of practices and technologies including field observation and rainfall data collection, application of straw and organic fertilizer, planting of vegetables on rice bunds as well as rice-fish cultivation.

Application of these technologies and practices led to a number of positive outcomes. Establishing rice-fish systems also led to improved water management practices on farm. Farmers were also able to diversify their incomes through the sale of fish while not needing to reduce rice output. The local government has taken interest in the initiative and has looked to provide additional support to scale-up the practices.

---

**Decision Support System Tool for Climate-Smart Agriculture in Lao PDR**

**Authors:**
Inthavong Thavone, NAFRI
Phimphachanhvongsod Viengsavanh, NAFRI
Bounthee, MONRE

This case study focused on the establishment of a Decision Support System (DSS) for guiding farmers in taking appropriate management decisions on crops, soil and water to better cope with seasonal climate variability and change. The DSS for rice, called Best Rice Crop Management Technologies or BRMP, was piloted through Climate Farmer Field Schools to raise farmer awareness and hands-on training. Practices applied in combination with BRMP included soil amendments, crop rotation and value chain development. Use of BRMP been found to result in improved farm performance when compared to existing practices; particularly in terms of reducing emissions from rice paddy.
Climate smart practice and potential adaptation/mitigation for rice production in Malaysia

Authors:
Dr. Mohamad Zabawi bin Abdul Ghani, MARDI
Zamrizam Samsuri, MARDI
Mohd Fahmi Mokhly, MARDI
Mohd Syaifudin Abdul Rahman, MARDI
Mohammad Hariz Abdul Rahman, MARDI
Nurul Ain Abu Bakar, MARDI

This case study focused on the application of adaptation and mitigation measures in rice fields at a national scale. Adaptation measures adopted included drought tolerant varieties, precision farming, land levelling and water recycling and re-use. Mitigation measures adopted included life cycle assessment, microbial applications, application of straw to rice fields and AWD. The results of the initiative are ongoing. However, early results indicate that AWD has been able to reduce water usage and GHG emissions and that use of microbial technologies can increase the rate of straw degradation and emissions from flooded rice fields.

Developing policies to support for Climate-smart rice production in Vietnam’s Nationally Determined Contributions (NDCs)

Authors:
Tran Van The, IAE
Mai Van Trinh, IAE
Nguyen Van Thiet, IAE
Le Hoang Anh, MARD
Bui My Binh, MARD
Bui Thi Phuong Loan, IAE
Nguyen Trung Thong, FAO
Leo Sebastian, CCAFS

This case study presented relevant policies needed to be developed to support climate smart rice as important options in Viet Nam’s NDCs. Rice is the most important crop in Vietnam and also a significant source of GHG – 33.2% of total national emissions in 2013.

To address this issue the Vietnamese Ministry of Agriculture and Rural Development has developed supportive policies including support for capacity building on climate smart agriculture, development of MRV systems and improved mechanisms for coordination between stakeholders at different scales. These initiatives have enabled the government to specify emissions targets and improved readiness to implement Vietnam’s NDC. However, challenges such as finance remain to be resolved.
Rice-Shrimp farming in the Mekong Delta of Vietnam: A climate smart farming model

Authors:
Chau Thi Tuyet Hanh - DOF
Le Thanh Tung – DCP
Phan Thi Thu – VIFEP

This case study focused on the adaptation and mitigation intervention in rice fields at the national level. Technical measures adopted under the program included rice field modification, preparation of field and trenches for rice and shrimp cultivation, wider use of salt tolerant rice varieties and improved weed and pet control.

Application of rice-shrimp systems has led to an average increase of 15-30% output compared to rice monoculture or shrimp only farming. Despite the success of these approaches, further improvements are required to ensure that the production system is optimized including measures to improve stocking density and guidance on desalination and the appropriate design/rehabilitation of rice paddies so that they continue to be favorable for rice-shrimp farming.

Irrigation under Climate Change in Kelantan River Basin

Authors:
Mohd Zaki M. Armin, NAHRIM
Baharudin Abdullah, KADA & MOA
Mohd Zaki Mat, KADA & MOA

This case study focused on the potential to adopt pumping systems to address declines in river levels; particularly during drought periods linked to climate change. Assessment of the suitability of the pumping systems required modelling to simulate varying expected water levels associated with different climate scenarios.

As a result of the assessment, the installation of three pumping systems has been propped as well as the establishment of committees and to improve management of pumping operations.
Rice-Fish Farming in Cambodia

Authors: Chin Da, Department of Aquaculture

This case study focused on a number of rice-fish farming trials implemented in a number of provinces in Cambodia with the support of JICA. The trials have indicated that rice-fish farming can result in increased farmer output of both rice and fish. The trials also indicate that adoption of rice-fish farming can improve sustainability by reducing the need for fertilizer and pesticide application. One potential limitation is water in the dry season. The Royal Government of Cambodia is investigating ways to scale-up the practice.

Climate-smart rice in Indonesia

Authors: Eni Yulianingsih, IAERI Yiyi Sulaeman, IAERI Eko Prasondita, Directorate for Climate Change Mitigation

This case study focused on several measures adopted by the Government of Indonesia to address GHGs in irrigated rice paddy fields. The core measure is the adoption of the Integrated Crop Management system (ICM) based on four key principles: (i) planting low-emission crops, (ii) implementing of water-efficient irrigation technique in water management, (ii) producing biogas in manure management, and (iv) feeding supplement for cattle. Research investigating the impact of ICM indicate that it is a suitable approach for reducing emissions from rice in Indonesia. GOI is now investigating ways to scale-up the approach.
Innovative Rice-Fish Farming and Climate Resilient Tilapia Pond Culture: Practices for Blue-Growth in Asia

Authors:
Tajuddin Idris, Directorate General of Aquaculture

This case study focused on the adoption of rice-fish farming in two villages in Central Java. The project involved a number of demonstration activities including trench making, fish stocking, feed application, fish farmer coordination and monitoring and evaluation.

The results of the demonstration have included increased levels of rice production and reduced use of pesticide and fertilizers. Farmers have also diversified their incomes through fish production.
Current initiatives and activities in the region on reducing emissions and increasing resilience

This session aimed to build awareness of ongoing research initiatives at national and regional levels to increase resilience in and reduce emissions from rice production systems. To improve the coherence of this report, initiatives relevant to this session that were presented during other sessions of the workshop have been consolidated here.

Assessing the feasibility of GHG mitigation through water saving techniques (Alternate Wetting and Drying) in irrigated rice fields in Southeast Asian countries

**Speaker**

Dr. Kazunori Minamikawa  
Senior Researcher  
JIRCAS

This international research project was designed to support the activities of the Global Research Alliance’s (GRA) Paddy Rice Research Group and was implemented in five participating countries (Vietnam, Thailand, the Philippines, Indonesia and Japan). Under a shared experiment protocol, the study was conducted over a period of three years during both the dry and wet season (rice double cropping). Three water management practices were tested: continuous flooding (CF), safe Alternate Wetting and Drying (AWD), and site-specific AWD. Some key findings of the research presented were that:

- The mean CH$_4$ scaling factors for AWD was 0.69 (95%CI: 0.61-0.77) among the four sites (lower mitigation potential than IPCC’s scaling factors of 0.52).
- In Vietnam and Indonesian research sites, both of which had a loamy soil, AWD was effective even in wet seasons.
- In Thailand and the Philippines, AWD was unsuitable in wet seasons due to the frequent rainfall and the slow water percolation in clay soils.
- The results indicate that IPCC’s scaling factors may only be applied to irrigated rice fields where surface water level is controllable for a substantial period.

The Thai Rice NAMA Project

**Speaker**

Dr. Chitnucha Buddhaboon  
Rice Research Center  
Ubon Ratchathani

The overarching goal of the Thai Rice NAMA is to achieve transformational change through a paradigm shift from conventional to low-emission farming in Thailand. The project which will run through August 2023, aims to achieve this goal through the achievement of three key outputs:

- Farmers’ adoption of SRP Standard/GAP++ to reduce GHG emissions and realize additional co-benefits;
- Provision of mitigation services utilized by the farmers to achieve SRP certification (laser land leveling, straw and stubble management, AWD and site-specific nutrient management)
• Establishment of innovative incentive schemes at the national level to support transformation of the whole rice sector to low-emission production.

With a GHG emissions reduction target of 1.73 million tCO2eq over 5 years of implementation, the project aims to benefit 100,000 farmer households, 450,000 farmer household members as well as 2,100 mitigation service providers.

Rice nitrous oxide: a new solvable problem
Speakers
Dr. K. Kritee & Richie Ahuja
Environmental Defense Fund (EDF)

This research project was based on measurements taken from four farmer-managed farms in India between 2012 and 2014 with two kinds of AWD treatments: 1) one incorporating high nitrogen fertilizer; and 2) a second treatment with lower amounts of nitrogen fertilizer and higher amounts of organic matter. By comparing emissions using different kinds of intermittent flooding, a correlation was found between N2O emissions, flooding frequency and organic matter increase. Flooding frequency was found to be directly related to CH4, but inversely related to N2O. Organic matter use increased CH4 and decreased N2O emissions. It was found that N2O emissions from the AWD treatment sites were significantly higher than average and also higher than those recorded at fields using continuous flooding practices. In general, the research suggests that application of AWD needs to consider anticipated changes in both CH4 and N2O emissions and the site specific factors that influence the generation of these emissions.

Panel discussion session

FAO Asia and the Pacific: Regional Rice Initiative
Speaker
Rabi G. Rasaily
Farming and Food Systems Consultant
FAO RAP
The Regional Rice Initiative focuses on goods and services produced by and available from rice ecosystems and landscapes under four components:

- Water and Rice/Fish Systems;
- Biodiversity, landscape and ecosystem services, including forestry and agroforestry;
- Management Practices which include sustainable intensification of rice production and the save and grow approach; and
- Cross-cutting social, economic and policy issues.

The RRI has successfully demonstrated that sustainable intensification of rice production practices is effective. The results of the initiative in various sites around the region is that rice yields and farmer revenues can be increased through application of improved practices that reduce requirements for use of pesticide, fertilizer and seed and associated costs.

Soil carbon (C) sequestration for sustainable food production and climate change mitigation and the “4 per 1000” initiative

Speaker
Dr. Yasuhito Shirato
Research Manager for Climate Change
National Agriculture and Food Research Organization (NARO)

Soil Organic Carbon (SOC) levels prevailing at a given site result from the interactions of several ecosystem processes. Increasing levels of SOC has been found to be a useful mitigation strategy with other potential benefits including improved soil fertility and higher yields. Increasing soil carbon inputs or decreasing the decomposition rate of soil carbon are the main ways to increase SOC. The “4 per 1000” initiative, which was launched in 2015 at the Paris COP 21, is global initiative that aims to increase the soil organic matter content and carbon sequestration of soils by 0.4% annually to offset annual increases in atmospheric CO₂. The initiative has been welcomed and is being backed by over 280 partners throughout the world. Potential criticisms and limitations were acknowledged including SOC storage rates vary depending on soil type, climatic conditions and management options making a global target difficult to monitor and achieve.

The Asian Soil Partnership (ASP)

Speaker
Mr Pitayakon Limtong
Director of Office of Royal Initiated Project
Land Development Department
Ministry of Agriculture and Cooperatives, Thailand

The ASP is a regional chapter under the Global Soil Partnership. The aim of these partnerships are to improve the governance of soil resources and promote sustainable management of soils. The ASP has defined 5 key priority areas of action:

- Facilitate interactive consultative processes (both within and across borders) involving a range of entities and stakeholders.
• Interact with regional soil science societies and other mechanisms established under various conventions.
• Discuss and provide guidance on regional goals and priorities regarding soils.
• Catalyze cooperation within the region.

As part of its recent activities ASP developed initiatives to monitor and enhance soil organic carbon (SOC), published the Voluntary Guideline of Sustainable Soil Management (VGSSM) and established the Center of Excellence for Soil Research in Asia (CESRA).

AEGIS: a Multinational Consortium for Managing GHG emissions in Asia

Speakers

Prof. Andy Whiteley
Professor
School of Agriculture and Environment
University of Western Australia

Dr. Suman Georg
Research Fellow
School of Agriculture and Environment
University of Western Australia

The Action on Emission of GHGs for Integrated Sustainability (AEGIS) was launched at the beginning of 2018 and focuses on promoting mitigation through microbial solutions. AEGIS aims to reduce GHG emissions during increased rice production by identifying and assessing production-based mitigation strategies, monitoring GHG outputs under production conditions, form international quality training networks and developing associated policy expertise.

AEGIS is currently in the process of drafting a position paper encompassing its activities, which is expected to be published in June 2019. In connection with this activity it is building a network of partners in the region to implement projects in three key areas: multi-scale discovery science focused on microbial research, evidence-based policy development and the formation of training networks to develop the next generation of mitigation research professionals.

ASEAN Guidelines on Soil and Nutrient Management

Speaker

Jesse Binamira
Department of Agriculture
Philippines

The “Guidelines on Soil and Nutrient Management” is an ASEAN initiative aiming to improve food security by promoting adaptive and resilient ‘climate-smart’ agricultural systems, while maintaining the functional capacity of the soil resource to provide essential ecosystem functions, including mitigation of emissions of GHGs. The Guidelines highlight the importance of soil health for agricultural production systems, present technology packages and decision support tools such as the Fertility Capability Classification (FCC) and Site/Soil Specific Nutrient Management (SSNM) methodologies; and identifies strategies to promote the role of farmers as soil health champions, through capacity building efforts based on participatory and interactive learning processes.

In particular, Farmer Field Schools, or FFS, are highlighted as a unique opportunity for ASEAN farmers to apply more holistic approaches to sustainable soil management by shifting from a nutrient centered to more ecosystem-based approaches. FFS programs can help mainstream soil health into farmers’ practices and is a key mechanism for the wider application and use of the Guidelines. A FFS Curriculum, with studies and exercises on soil health, was designed with FFS farmers, facilitators and soil health
experts for a FAO piloted FFS soil health program in the Philippines, Laos and Indonesia. Experiences from the pilot FFSs helped evaluate and outline strategies for better integration and upscaling of soil health.

Sustainable Rice Platform

Speaker
William Wyn Ellis
Coordinator
Sustainable Rice Platform

Focusing on reducing vulnerability, enhancing food security and resource efficiency and serving as a repository of knowledge and expertise, the SRP endeavors to transform the rice sector and production system and reduce its environmental footprint, mitigate emissions and improve its resilience to climate change impacts. In order to drive wide-scale adoption of tech innovation and sustainable best practices SRP believes in the importance of defining what sustainability means and finding ways to measure it, in designing incentives as well as catalyzing sector transformation through new alliances and by creating shared value.

In 2015, SRP launched the world’s first Rice Sustainability Standard based on eight themes linked to the crop growth cycle. This standard differs from other sustainability standards as it is not only designed as a standard for compliance, but also as a system to reward progress towards sustainability. The Standard incorporates a shared definition of sustainability in rice and is being used both as a basis for certification in various supply chains as well as a normative tool to inform national policy development. The Standard is accompanied by a set of performance indicators, which allow for the benchmarking of sustainability in rice production systems.

Takeaway messages

- National research agencies are actively investigating new practices and technologies to increase the resilience and reduce emissions from rice production systems.

- Successful application of these measures at scale requires support in terms of technical advice, extension and access to new materials and infrastructure.

- At national and regional levels, international and national research and technical agencies are implementing initiatives that aim to address gaps and needs associated with the transfer of more sustainable rice production technologies and practices that can deliver resilience and mitigation benefits.
Climate Smart Rice Cultivation in Asia

The aim of this session was to improve understanding of the potential to reduce emissions and increase resilience in rice landscapes through the application of climate-smart rice production technologies and practices. The session involved a series of presentations designed to provide practical information on how to design and apply climate-smart rice production technologies. Discussion focused on the potential to scale-up these practices in Southeast Asia. To improve the coherence of this report, some items presented in this session have been moved to other sections of the report where they are considered more relevant.

Analysis of Suitable environment of the for the implementation of low-emissions technologies in rice production

Speakers

Dr. Bjorn Ole Sander  
Climate Change Specialist  
International Rice Research Institute

Dr. Yasukasu Hosen  
Co-chair of rice research group  
GRA, NARO

Research on Alternate Wetting and Drying (AWD) has demonstrated its potential to reduce GHG emissions and water use in rice production systems in the region. However, the success of AWD is context specific with results of implementation varying from one paddy field to the other. Both IRRI and JIRCAS conducted research in Vietnam’s Mekong Delta to explore suitable water, soil and socio-economic parameters for the effective implementation of AWD in rice production. Some key findings of the research presented were that:

- The geographical application of AWD should be prioritized based on where the mitigation potential is highest. Identifying regions with high mitigation potential requires careful assessment taking into account various biophysical characteristics.
- In general, AWD should be applied where water is abundant and controllable and where soils have low sulfide and low cadmium concentration. AWD is also suitable where expected precipitation is low enough to allow for fields to drain independently i.e. where precipitation is lower than the natural rate of drainage from the field. To identify regions where this condition applies, the assessment of suitability for AWD should take into consideration soil texture, percolation, rainfall, temperature and solar radiation for instance.
- Socio-economic factors are also an important consideration when deciding where to implement AWD. Factors such as farmer awareness and capacity and the availability of irrigation facilities for need to be considered when prioritizing AWD.

MRV for a GHG mitigation project with water management in irrigated rice paddies

Speaker

Dr. Kazunori Minamikawa  
Senior Researcher  
JIRCAS

The availability of reliable MRV methodologies is important for ensuring the accuracy and reliability of emissions reduction measures adopted in rice production systems. MRV typically involves monitoring...
and reporting processes which are implemented according to a set MRV methodology, an evaluation of reported achievements and on-site inspection by a third party. Based on experiences in the region, MRV implementation can be hindered by several factors including difficulty in distinguishing anthropogenic contributions to GHG emissions from natural variability; the spatial and temporal variability in GHG emissions due to varying environmental conditions across landscapes; and the delayed effects of agricultural activities on GHG emissions.

Panel discussion session

Trees in rice production landscape

Speaker

James M. Roshetko
Leader Trees, Agroforestry Management and Market Unit
World Agroforestry Centre (ICRAF)

Agro-forestation of rice landscapes can improve farmers’ resilience to climate change by helping them diversify production, increase their productivity and increase incomes by reducing risks associated with market fluctuations and varying crop yields. Trees in rice-production landscapes provide four types of services to enhance agro-ecosystem function and resilience:

- Supporting services such as soil formation, soil conservation, fallow improvement, nitrogen fixation and nutrient cycling.
- Provisioning services such as food production (rice, other crops, wild plants, fish, wild game), timber, poles, fuel (wood & others), and organic matter.
- Regulating services such as windbreaks shade and micro-site enhancement; water regulation, habitat for wildlife, including insects and fish.
- Cultural services stemming from the important cultural value that rice farming and rice landscapes hold for people in the region.

Despite the potential benefits, integrating trees in rice landscapes has not been a widely adopted climate change adaptation and mitigation measure. There may be opportunities for policy makers to adopt a more proactive position towards adopting agro-forestry as a climate change management strategy in rice production systems to contribute to regional livelihood and conservation goals.
Integrated rice-fish farming contributing to CC mitigation and adaptation, environmental benefits, food safety and resilient rice production

Speaker
Miao Weimin
Aquaculture Officer
FAO ROAP

Integrated rice-fish farming (IRFF) is an ancient practice which has mainly been used in the past decades for ecological benefits (pest management and lower chemical use) and contribution to local food and nutrition. Today IRFF is also promoted for its contribution to climate change mitigation and adaptation, its role in improving efficiency in natural resources use (water & land), and its benefits in terms of income improvement through increased yield and product diversification.

IRFF can contribute to climate change mitigation by reducing the use of fertilizer for rice production (fish feces serve this purpose), of artificial feed as well as energy in fish production and of chemicals for controlling diseases, pest and weeds. IRFF contributes to climate change adaptation by making it possible to produce resistant aquatic animals (shrimp, brackish water fish) during the dry season where some rice paddies with high salinity makes it impossible to grow rice. It also contributes to better water management as necessary improvements to irrigation systems to facilitate rice-fish integration can help supply water in dry season/drought condition. Finally, IRFF contributes to resilient rice production by helping to increase the income of rice farmers (2-3 times higher net profit), diversifying livelihoods and managing risks to production.

The Changing Landscape in Paddy Irrigation Systems - The Case in Malaysia

Speaker
Mohd Adnan Mohd Nor
Malaysian National Committee on Irrigation and Drainage (MANCID)

Water management systems are slowly evolving from single-use to a multi-use systems. This evolution has come about as economies have diversified and modernized required that they meet the needs of a wider range of users – not just agriculture. In Malaysia, water management systems are also increasingly impacted by land issues with many rice paddies now being converted to urban areas or repurposed by the timber logging industry. Increasing sectorial demands and pressures on common resources (water and land), brings challenges but also opportunities for paddy irrigation managers, which find themselves at the center of a multi-stakeholder engagement process. Managing climate change impacts and drivers is a new challenge that may also present opportunities for improved water management outcomes.

Landscape-based approaches are a useful way to consider management options that account for the different trade-offs between users. As a result, irrigation managers are uniquely well placed to initiate and lead the implementation of landscape-based management responses that can account for sector demands and climate change adaptation and mitigation.
Save and Grow: FAO’s approach to building more productive, resource use efficient, resilient and climate-smart rice farming systems for food and nutrition security in Asia

Speakers
Jan Willem Ketelaar  
Chief Technical Adviser  
FAO

Arief Lukman Hakim  
Program Development Specialist  
FIELD Indonesia

FAO’s “Save and Grow” model of sustainable intensification of crop production aims to achieve the highest possible productivity by unit of production input within the ecosystem's carrying capacity. This model is the cornerstone of climate-smart crop production – guiding climate-smart strategies that prevent soil damage, promote soil and water conservation, and increase productivity. The Save and Grow approach is based on a 3-step methodology:

- Identifying factors that influence the adoption of sustainable and climate-smart practices and potential barriers to their uptake.
- Addressing factors that limit the sustainable and climate-smart intensification and diversification of stallholder production systems, through the organization of Farmer Field Schools and developing field-based evidence showing that productivity can be increased while reducing input and increasing livelihood.
- Using that evidence to enable policy and regulatory reform and scale up the methodology that was validated at Country level to Regional level.

Takeaway messages

- Climate-smart rice production technologies and practices aim to both increase the resilience of rice production systems to climate change and reduce emissions, while maintaining productivity and farmer livelihoods.

- A number climate-smart practices have been applied in countries around the region providing examples and best practices that can be adopted at larger scales.

- Climate-smart practices need to account for the interests of a range of stakeholders and account for ecosystem health and function.

- Establishing effective systems for monitoring implementation of climate-smart practices is crucial for ensuring that their adoption will contribute to the achievement of environmental goals, while maintaining farm productivity.
Developing a rice climate action plan

During this session country groups worked to develop a Rice Climate Action Plan incorporating strategies and actions at the national level to scale-up more effective action to address GHG emissions and increase resilience in rice landscapes. In preparing the plans groups were asked to reflect upon earlier knowledge sessions and how the information shared might be best used to support national level planning and policy formulation to support the action plan, particularly related to countries NDC priorities for the rice and agriculture sub-sectors.
The plans developed are available at this [link](#). Below is a synthesis of the action plans developed by county delegates.

### Table 1 – Synthesis Rice Sector Climate Action Plans in Southeast Asia

<table>
<thead>
<tr>
<th>ACTION GAPS</th>
<th>Type/Solution Mix</th>
<th>Target Outcome</th>
<th>Scope/Area</th>
<th>Key Stakeholders</th>
<th>Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and development</td>
<td>Policy Advocacy</td>
<td>Data information on rice based GHG</td>
<td>Rain-fed &amp; irrigated rice land</td>
<td>Ministries</td>
<td>Government</td>
</tr>
<tr>
<td>Limited training capacity</td>
<td>Training/ awareness raising</td>
<td>Staff capacity improved</td>
<td></td>
<td>Policy Makers</td>
<td>NGOs</td>
</tr>
<tr>
<td>Lack/limited farmer awareness on GHG emission, smart agriculture</td>
<td>Funding Resources</td>
<td>Farmers trained</td>
<td></td>
<td>Private sector</td>
<td>GEF</td>
</tr>
<tr>
<td>Access to technology and knowledge</td>
<td>Technological transfer</td>
<td>New, applicable technology/applied</td>
<td></td>
<td>NGOs</td>
<td>GCF</td>
</tr>
<tr>
<td>Financial resources</td>
<td>Public private partnership</td>
<td>Policy support</td>
<td></td>
<td>Farmers</td>
<td>INGOs</td>
</tr>
<tr>
<td>Market information</td>
<td>Research</td>
<td>Legislation</td>
<td></td>
<td>Academia, research institutions</td>
<td>Private sector</td>
</tr>
<tr>
<td>Political will</td>
<td>Knowledge management</td>
<td>Enhanced PPP</td>
<td></td>
<td>Donors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication strategy</td>
<td>Water saving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emission reduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Farmer income increase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduction of chemical/ pesticide use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yield increase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil conservation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Driving investment in climate smart landscapes and the role of the private sector

During this session a panel discussion was organized to shed light on the role of the private sector and the challenges and opportunities for greater investment in climate-smart agriculture. The session also looked to improve understanding of private sector perspectives on how to unlock investment in climate-smart rice production in Southeast Asia and to generate discussion on how public and private partners can drive future investment in climate smart-rice landscapes.

Panel members noted that the private sector is not a monolithic entity. It is comprised of a wide variety of actors (supply chain actors, input suppliers, service providers, etc...) that require a tailored business case to support investment in sustainable approaches. The private sector will only engage in climate smart agriculture if it has an impact on its balance sheet. If actions in the field are not aligned with the needs of the companies and those of their investors and shareholders, long-term private-sector engagement will not be possible. When interacting with SME’s, larger agribusinesses need to assess counterparty (default) risk. SME’s often don’t have enough transaction history to be able to correctly assess this risk or don’t have enough finances to be considered a trusted counterpart.

The case for investment in climate smart agriculture can be further complicated because the visions of the public and private sectors are often not aligned. Public and private sector organizations often don’t speak the same language and are used to operating in different environments that cater to the needs of different stakeholders. Panelists stressed the importance of face to face interaction between public and private sector stakeholders to improve understanding of the realities and limitations of each party. ASEAN is working to equip its members with tools to attract and increase private sector investment in

**Moderator**
Tony Siantonas
Manager, Climate Smart Agriculture
World Business Council for Sustainable Development (WBSD)

**Panelists**
Paul Nicholson
Vice President of Rice Research and Sustainability, Olam
Imelda Bacudo
Principal Advisor for Climate Change activities in ASEAN, GIZ
William Wynn Ellis
Coordinator, Sustainable Rice Platform
Astari Widya Dharma
GIZ.
Last year the ASEAN Ministers of Agriculture and Forestry with the assistance of the ASEAN Technical Working Group on Agriculture Research and Development, published the “ASEAN Public Private Partnership Regional Framework for Technology Development in the Food, Agriculture and Forestry (FAF) Sector” which was created with the aim to set-up guiding principles behind PPP in the region.

The regulatory and policy environment needs to recognize, promote and reward public-private partnerships. There have already been some success stories. A number of programmes facilitated by the private sector in the region have been matched by public sector funding from development partners. These kinds of funding schemes can in turn be attractive to private sector actors knowing that their investment will be matched by public sector sources. Government could also consider other measures such as tariff reductions for sustainable rice as well as regulations to lower capital costs for resilient rice to incentivize private sector actors and reward them for reducing risk on the market.

A key challenge for further investment in climate smart rice is that rice does not typically attract the same private-sector interest as other premium-led agricultural products such as cocoa, coffee or sugar. These commodities have traditionally had more success co-branding with sustainability initiatives and collecting premiums out of the market. However, private sector involvement in the design of sustainability standards and indicators can act as a catalyst for private sector action. For example, the launch of the SRP’s Rice Sustainable Standards coincided with the commitment of a number of organizations to 100% sustainable sourcing in their global rice supply chains. Having the standard rolled-out by the private sector can lead to impact that go beyond the corporate supply chain. Advocacy is crucial for raising awareness of the interests of both public and private sector stakeholders and finding areas of common ground and action. It can generate interest at the institutional level, raise awareness of policy makers looking for best practices in the field and lead to policy change.

**Takeaway messages**

- The private sector involves a wide variety of actors that require a tailored business case to support investment in sustainable approaches. The private sector will only engage in climate smart agriculture if it has an impact on its balance sheet.

- The case for investment in climate smart agriculture can be further complicated because the visions of the public and private sectors are often not aligned. Increased interaction between public and private sector stakeholders will help to overcome barriers and identify viable ways to collaborate to promote climate smart agriculture.

- Public incentives are crucial for unlocking private sector investment in climate smart rice production. The regulatory and policy environment should recognize, promote and reward public-private partnerships that target these types of more sustainable approaches.

- Rice is not considered a high value crop, and this represents a key barrier for sustainability linked premiums for rice products. However, private sector involvement in the design of sustainability standards and indicators can act as a catalyst for private sector action and more conducive policies.
Promoting and scaling-up sustainable rice landscapes

The objectives of this session was to familiarize the participants with the importance of applying a landscape approach and integrated systems thinking into planning process to increase the sustainability of rice landscapes. It also introduced the participants to existing and potential public climate financing mechanisms available to support actions and initiatives in the rice sector.

Integrating rice into landscape-based approaches

Speaker
Adrian Barrance
FAO

Farms are not isolated units within a landscape. They are interlinked with different elements of the landscape and one need to take this into account when approaching the issues of sustainability, equity and resilience. There are different dimensions of landscape: spatial, human and time-based. The landscape runs from source to sea, therefore rice production practices impacts the farm itself but also several elements within the watershed and can also have global effects (climate change). In the longer term those local and global impacts feedback to the farm.

The Farmer’s areas of operation consist of farms and commons. Mismanagement of these areas leads to degradation of the natural ecosystem of the farm. Productive interaction between the farm and the commons, farm livelihoods also depends on its interaction with the natural ecosystems. Market forces can also affect the drivers of unsustainable management of natural ecosystems. They influence production processes and how commons and farm are managed. This influence can be negative for instance in the case of unsustainable timber extraction or intensive palm oil production, but they also can be a force for good when the value chain is pushing for sustainable production.

Changes are undermining livelihoods and landscape sustainability. Factors such as climate change, changing in tenure condition land rights, demographic change, rural migration, cultural globalization for instance need to be taken into account within a landscape-based approach. It is therefore valuable to move away from a rice production approach and adopt inclusive, landscape-based approaches that deliver a range of social and environmental benefits.

Public climate finance for scaling-up sustainable rice landscapes

Speakers
Beau Damen
Natural Resources Officer
FAO
Aaron Becker
GEF Programme Development Expert
FAO

International public climate finance is servicing international agreements and multilateral environmental agreements that provide a framework for which this finance has to operate. Public climate finance represent only 1% of the funding dedicated to financing action on climate change. However, public climate finance can be an important catalyst for climate action; particularly where solutions to climate change challenges involve common resources and public goods or require additional incentive to promote adoption and scale-up.
Two of the largest providers of public climate finance are the Green Climate Fund (GCF) and the Global Environment Facility (GEF). The GCF was established directly under the United Nations Framework Convention on Climate Change (UNFCCC). It has different modes of access ranging from full projects to smaller preparatory and readiness-oriented funding. The GCF has clearly defined investment criteria that requires a clear focus on addressing a climate change specific problem. The GCF also places a high premium on cost-effectiveness of the projects supported. Project development lead times can be significant (averaging 2 to 3 years) requiring time and resources. The fund has two cross cutting investment priorities related to agriculture and forestry: sustainable, low emission and resilient agriculture and scaling up finance for forest and climate change.

The GEF was established to serve as financial mechanism for a number of multilateral environmental agreements including the UNFCCC. It works to support countries commitments under these agreements by providing funds to cover the incremental costs associated with making economic development sustainable through the generation of national and global environment benefits (GEBs). The GEF is evaluates the suitability of projects based on the following criteria:

- High potential/ability to generate multiple GEBs (importance of food production levels and countries engagement like for the Bonn Challenge).
- Contribution to wider national/sub-national strategy.
- Public sector support (policy and institutional).
- Private sector involvement (markets and financing).
- Potential for achieving large-scale change.
- Ability to catalyze innovations generated in technology, policy, governance, financing, and business models.

Under its latest funding window, the GEF has established new impact programs to maximize its ability to generate GEBs from integrated, cross-sectoral and landscape-based initiatives of significant scale. One of these impact programmes on food systems, land use and restoration is highly relevant to initiatives looking to scale-up landscape-based approaches integrating climate smart production technologies and practices.
Sustainable Rice Landscape – Developing a Regional Initiative

Country representatives were asked to develop short project concepts on Climate Smart Sustainable Rice Landscapes, followed by a discussion on developing a regional initiative on Sustainable Rice Platform. (Annex 2).

Participants preparing their sustainable rice landscape initiatives

©FAO
Takeaway messages

- Rice production systems are interlinked with different elements of the landscape and these need to be accounted for when looking to generate positive spillovers associated with sustainability, equity and resilience.

- Public climate finance, while only a small portion of overall climate finance, finance can be an important catalyst for climate action; particularly where solutions to climate change challenges involve common resources and public goods or require additional incentive to promote adoption and scale-up.

- Two key sources of climate finance, the Green Climate Fund and the Global Environment Facility, are looking to support projects that can transform agricultural production systems in ways that enhance sustainability, reduce emissions and increase resilience.

- These funds may present viable platforms for private and public stakeholders looking to promote climate smart rice production systems to purse partnerships to invest in and scale-up these systems in the region.
## Annex 1 Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Lead Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30-09:00</td>
<td>Registration</td>
<td>FAO</td>
</tr>
<tr>
<td>09:00-09:10</td>
<td>Opening remarks 1</td>
<td>Xiangun Yao, FAO</td>
</tr>
<tr>
<td>09:10-09:15</td>
<td>Opening remarks 2</td>
<td>Mr Ichiro Nakagawa, MAFF Japan</td>
</tr>
<tr>
<td>09:15-09:30</td>
<td>Welcome, Background to the Meeting and Objectives</td>
<td>FAO</td>
</tr>
<tr>
<td>09:30-10:30</td>
<td><strong>SESSION 1 - Briefing 1a:</strong> Significance of the Paris Agreement for Agriculture and measures for mitigation and adaptation in the agriculture sectors with a focus on rice landscapes</td>
<td>ASEAN CRN</td>
</tr>
<tr>
<td></td>
<td>Description: This session will encompass a series of presentations on the following topics,</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Topics and Speakers:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Importance of reducing GHG emission</td>
<td>FAO</td>
</tr>
<tr>
<td></td>
<td>• in the agriculture sector and rice landscapes in particular - Beau Damen</td>
<td>JGSEE</td>
</tr>
<tr>
<td></td>
<td>• Technical paper on ‘current state of soil management initiatives in SEA for mitigation and resilience’: - Dr. Sirintornthep Towprayoon</td>
<td></td>
</tr>
<tr>
<td>10:30-11:00</td>
<td>Group Photo + Coffee Break</td>
<td></td>
</tr>
<tr>
<td>11:00-12:00</td>
<td><strong>SESSION 2 - Interactive 1a:</strong> Baseline situations for actions in climate change in Rice Landscapes</td>
<td>FAO</td>
</tr>
<tr>
<td></td>
<td>Description: This session will identify the broader policies at the national scale on rice and climate change in general and how they can contribute towards achieving the NDC goals and targets</td>
<td></td>
</tr>
<tr>
<td>12:00-13:00</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>13:00-14:00</td>
<td><strong>SESSION 3 – Interactive 1b:</strong> Country experiences in reducing emissions and increasing resilience in rice landscapes</td>
<td>FAO</td>
</tr>
<tr>
<td></td>
<td>Description: Country delegates will present a pre-prepared poster* identifying current initiatives, needs and gaps in reducing emissions and increasing resilience in rice landscapes with a particular focus on soil management. Countries will have 5 minutes each to present to their audience at their ‘café’ which will then be followed by short discussions and Q/A rounds.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*A case study template will be provided to country delegates in advance of the workshop</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Lead Organization</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>14:00-15:00</td>
<td><strong>SESSION 4 – Knowledge 1a: Current initiatives and activities in the region on reducing emissions and increasing resilience in rice landscapes</strong>&lt;br&gt;&lt;br&gt;<em>Description:</em> The session will introduce the following key topics through a series of presentations on country case studies.&lt;br&gt;&lt;br&gt;<em>Title:</em> Assessing the feasibility of GHG mitigation through water saving techniques (AWD) in irrigated rice fields in southeast Asian countries (FYs 2013 – 2017 funded by MAFF of Japan)&lt;br&gt;&lt;br&gt;<em>Speakers:</em>&lt;br&gt;• General overview: Dr. Kazunori Minamikawa&lt;br&gt;• <strong>INDONESIA</strong>: Mr. Ali Pramono&lt;br&gt;• <strong>VIETNAM</strong>: Mr. Nghia Trong Hoang</td>
<td>APEC</td>
</tr>
<tr>
<td>15:00-15:30</td>
<td><strong>Coffee Break</strong></td>
<td></td>
</tr>
<tr>
<td>15:30-16:00</td>
<td><strong>SESSION 4 - Knowledge 1a: Current initiatives and activities in the region on reducing emissions and increasing resilience in rice landscapes (cont.)</strong>&lt;br&gt;&lt;br&gt;<em>Description:</em> The session will introduce the following key topics through a series of presentations on country case studies.&lt;br&gt;&lt;br&gt;<em>Title:</em> Assessing the feasibility of GHG mitigation through water saving techniques (AWD) in irrigated rice fields in southeast Asian countries (FYs 2013 – 2017 funded by MAFF of Japan)&lt;br&gt;&lt;br&gt;<em>Speakers:</em>&lt;br&gt;• THAILAND: Dr. Amnat Chidthaisong&lt;br&gt;• PHILIPPINES: Ms. Kristine Samoy-Pascual</td>
<td>APEC</td>
</tr>
<tr>
<td>16:00-17:30</td>
<td><strong>SESSION 5 - Knowledge 1b: Current initiatives and activities in the region on reducing emissions and increasing resilience in rice landscapes</strong>&lt;br&gt;&lt;br&gt;<em>Description:</em> The session will introduce the following key topics through a series of presentations:&lt;br&gt;• FAO Asia Regional Rice Initiative - Rabi G.&lt;br&gt;• Asia Soil Partnership (ASP) framework in Thailand - Mr Pitayakon Limtong&lt;br&gt;• ASEAN-Guidelines on Soil and Nutrient Management - Jesse Binamira&lt;br&gt;• Planned research initiatives by AEGIS - Professor Andy Whiteley and Dr Suman George&lt;br&gt;• Sustainable Rice Platform - William Wyn Ellis</td>
<td>TBD</td>
</tr>
<tr>
<td>17:30 –17:45</td>
<td><strong>Wrap-up: Summary of the Day 1</strong></td>
<td>FAO</td>
</tr>
<tr>
<td>08:30-09:00</td>
<td><strong>Registration</strong></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Lead Organization</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>09:00-09:10</td>
<td>Revisiting Workshop Objectives and Key Messages from Day 1</td>
<td>FAO</td>
</tr>
<tr>
<td>09:10-10:30</td>
<td><strong>SESSION 6 - Knowledge 2a: Capacity Building for Climate Smart Rice Cultivation in Asia</strong></td>
<td>APEC</td>
</tr>
<tr>
<td></td>
<td><strong>Description:</strong> Trainers from research institutes will provide a series of presentations on the following topics,</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Topics and Speakers:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• What kind of environment should be targeted for AWD introduction?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Analysis of suitable environments for the implementation of low-</td>
<td>IRRI</td>
</tr>
<tr>
<td></td>
<td>emissions technologies in rice production - Dr. Bjoern Ole Sander</td>
<td>NIAES, NARO</td>
</tr>
<tr>
<td></td>
<td>o Through the experience in the Mekong Delta - Dr. Yasukazu Hosen</td>
<td>JIRCAS</td>
</tr>
<tr>
<td></td>
<td>• MRV for a GHG mitigation project with water management in irrigated rice paddies: Dr. Kazunori Minamikawa</td>
<td>Rice Department, Thailand</td>
</tr>
<tr>
<td></td>
<td>• A rice NAMA project in Thailand - Dr. Chitnucha Buddhhaboon</td>
<td>NIAES, NARO</td>
</tr>
<tr>
<td></td>
<td>• Soil C sequestration for sustainable food production and climate change mitigation: Dr. Yasuhito Shirato</td>
<td></td>
</tr>
<tr>
<td>10:30-11:00</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>11:00-12:30</td>
<td><strong>SESSION 7 - Knowledge 2b: Capacity Building for Climate Smart Rice Cultivation in Asia</strong></td>
<td>ASEAN CRN</td>
</tr>
<tr>
<td></td>
<td><strong>Description:</strong> Resource persons from research institutes will provide a series of presentations on topics including:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Trees in rice landscape - James M. Roschetko</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 'High nitrous oxide fluxes from rice indicate the need to manage water for both long- and short-term climate impacts’ – research paper - - Dr. K Dr. K. Kritee &amp; Richie Ahuja</td>
<td>ICRAF EDF FAO FAO/IPM</td>
</tr>
<tr>
<td></td>
<td>• Water and integrated rice-fish system - Miao Weimin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Multipurpose irrigation mechanisms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Water resources managements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Save and Grow: Capacity building for Sustainable Intensification of Rice Production through Farmers Field Schools - Jan Willem Ketelaar &amp; Arief Hakim</td>
<td></td>
</tr>
<tr>
<td>12:30-13:30</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>13:30-15:30</td>
<td><strong>SESSION 8 - Interactive 2a: Developing a Rice Climate Action Plan</strong></td>
<td>FAO</td>
</tr>
<tr>
<td></td>
<td><strong>Description:</strong> This session will engage the country working groups to identify strategies and actions required for reducing emissions and increasing resilience in rice landscapes at national and regional levels and work towards developing a Rice Climate Action Plan. Groups will be asked to reflect upon earlier knowledge sessions and how it might be best used to support national and regional level planning and policy formulation to support the action plan – particularly related to countries NDC priorities for the rice and agriculture sub-sectors.</td>
<td></td>
</tr>
<tr>
<td>15:30 – 16:00</td>
<td><strong>Coffee Break</strong></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Lead Organization</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>16:00 – 17:00</td>
<td><strong>SESSION 9 - Discussion 2a</strong>: Driving investment in climate smart-rice landscapes and the role of the private sector</td>
<td>WBCSD, IRRI, GIZ</td>
</tr>
<tr>
<td></td>
<td>Description: This session will engage participants into a panel discussion how public and private partners can drive future investment in climate smart-rice landscapes.</td>
<td></td>
</tr>
<tr>
<td>17:00 – 17:15</td>
<td><strong>Wrap-up</strong>: Summary and workshop evaluation</td>
<td>FAO</td>
</tr>
</tbody>
</table>

**Day 3 – Sustainable Rice Landscapes**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Lead Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30-09:00</td>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>09:00-10:00</td>
<td><strong>SESSION 10 - Briefing 3a</strong>: Sustainable Rice Landscapes – An Introduction</td>
<td>FAO, SRP, UNEP, IRRI, WBCSD, GIZ</td>
</tr>
<tr>
<td></td>
<td>Description: This session will encompass a series of presentations on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sustainable Rice Platform (SRP) - William Wyn Ellis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identifying climate financing mechanisms for activities on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sustainable Rice Landscapes - Beau Damen</td>
<td></td>
</tr>
<tr>
<td>10:00-10:30</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>10:30 – 11:30</td>
<td><strong>SESSION 11 - Interactive 3a</strong>: Sustainable Rice Landscapes – Developing a Regional Initiative</td>
<td>FAO, SRP, UNEP, IRRI, WBCSD, GIZ</td>
</tr>
<tr>
<td></td>
<td>Description: Country delegates will work together to develop short project concepts on Climate Smart Sustainable Rice Landscapes, followed by a discussion on developing a regional initiative on Sustainable Rice Platform (SRP)</td>
<td></td>
</tr>
<tr>
<td>11:30 – 12:00</td>
<td><strong>Wrap-up</strong>: Summary and way forward</td>
<td>FAO</td>
</tr>
</tbody>
</table>

**Workshop Close**

| 12:00-13:00  | Lunch                                                                 |                   |

**Follow-up Afternoon Meetings organized for selected participants**

<table>
<thead>
<tr>
<th>Time</th>
<th><em>Session I</em></th>
<th><em>Session II</em></th>
<th><em>Session III</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00-14:00</td>
<td>SRL Meeting</td>
<td>GRA Paddy Rice Research Group Meeting</td>
<td>Rice/Fish systems</td>
</tr>
</tbody>
</table>

Session I: SRL Partners  
Session II: GRA  
Session III: FAO
## Annex 2 Climate-smart Sustainable Rice Landscapes Project Concept

### 1. Project / Programme Information

<table>
<thead>
<tr>
<th>Project / programme title</th>
<th>Emission Factors and mitigation options for rice production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Executing Agencies</td>
<td>INIA, NARO</td>
</tr>
<tr>
<td>(lead national government institutions and main technical partners)</td>
<td></td>
</tr>
<tr>
<td>Main Beneficiaries</td>
<td>Government, farmers, milling industry</td>
</tr>
<tr>
<td>Proposed funding (in USD)</td>
<td>100 000 USD</td>
</tr>
<tr>
<td>Project / programme life span</td>
<td>4 years</td>
</tr>
<tr>
<td>Climate Action Gap Addressed</td>
<td></td>
</tr>
</tbody>
</table>
| Focus | Emissions Reduction ☐
| | Stopping Land degradation ☐
| | Enhancing Biodiversity ☐
| | Cross-cutting ☐
| | Reducing chemical use ☐
| Climate Change and environmental baseline, problems and root causes (for national situations and the targeted landscapes) | No baseline for emission factors
| | Water reduction (deficiency) ↓
| | rain, ↓ temperature, no snow
| | Small rice area (flat) |
| Barriers (Key barriers preventing government, farmers, corporate etc. addressing the above key problems) | No Information, no capacity, limited funding, limited researchers and technical support |

### 2. Proposed Project

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outputs and/or main deliverables</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>Improved water management and efficiency use</td>
<td>Field experiment (at least 2 years)</td>
</tr>
<tr>
<td>GHG</td>
<td>Farmers informed</td>
<td>Validation in farmer’s land</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extension from the beginning</td>
</tr>
</tbody>
</table>

### 3. Potential Targets

<table>
<thead>
<tr>
<th>Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of land restored (Million Hectares)</td>
<td>25000</td>
</tr>
<tr>
<td>Area of landscapes under improved practices (excluding protected areas) (Million Hectares)</td>
<td></td>
</tr>
<tr>
<td>Total area under improved management (Million Hectares)</td>
<td>25000</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions Mitigated (million metric tons of CO2e)</td>
<td>&lt;30%</td>
</tr>
<tr>
<td>Number of shared water ecosystems (fresh or marine) under new or improved cooperative management</td>
<td></td>
</tr>
<tr>
<td>Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment</td>
<td></td>
</tr>
</tbody>
</table>

### 4. Contribution to national strategic priorities and policy

Contribute to national target target of GHG reduction (COP21)

- <30% emissions by 2020
- PIB

### 5. Transformative, innovation and replication potential of the project, partnership and co-finance arrangements

- FONTAGRO
- APEC
- National Financial (MAJIMA)
- FAO

©FAO
## Climate-Smart Sustainable Rice Landscapes

**Project Concept**

### 1. Project / Programme Information

**Project / programme title**
Building climate resilience and GHG emission reduction for rice farming in SE provinces

**Proposed Executing Agencies**
CARDL, DALRM (MAFF); DCC (NCSD)

**Main Beneficiaries**
Farmers, POA/FFs, NGOs, Private sectors, government official

**Proposed funding (in USD)**
4.5M USD

**Climate Action Gap Addressed**
GHG emission ↓, capacity building, smart technology, database development and management

**Focus**
- Emissions Reduction ▼
- Adaptation ▼
- Cross-cutting ▼
- Stopping Land degradation ▼
- Enhancing Biodiversity ▼
- Reducing chemical use ▼

**Climate Change and environmental baseline, problems and root causes**
Flood, drought, low soil fertilizer (Org. C, acidity...)
- LD, insect pest & diseases (BPH, BLB), poor farmer adaptive cap. (physical, financial)
- Limited capacity of government officials to deal with climate change

**Barriers**
Financial support, coordination, access to information

**Linkage of R & D with dev. Programs, private sectors**

### 2. Proposed Project

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outputs and/or main deliverables</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer resilience ↑</td>
<td>Crop yield ↑, Profits ↑</td>
<td>R &amp; D, farm demos, FFS, F. Exch.</td>
</tr>
<tr>
<td>GHG emission ↓</td>
<td>Database development and management</td>
<td>Res., data collection, MRV, BPs</td>
</tr>
<tr>
<td>CC capacity ↑</td>
<td>No. of farmers &amp; government officials in SE provinces</td>
<td>Training, awareness raising, meeting, workshop</td>
</tr>
</tbody>
</table>

### 3. Potential Targets

<table>
<thead>
<tr>
<th>Target</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)</td>
<td>3 prov. (PV, SR, TbK)</td>
</tr>
<tr>
<td>Area of land restored (Million Hectares)</td>
<td>5%</td>
</tr>
<tr>
<td>Area of landscapes under improved practices (excluding protected areas)(Million Hectares)</td>
<td>20%</td>
</tr>
<tr>
<td>Total area under improved management (Million Hectares)</td>
<td>20%</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions Mitigated (million metric tons of CO2e)</td>
<td>0.5t x areas of 3 prov</td>
</tr>
<tr>
<td>Number of shared water ecosystems (fresh or marine) under new or improved-cooperative management</td>
<td>Mekong Flir. Syst.</td>
</tr>
<tr>
<td>Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment</td>
<td>20-30% female</td>
</tr>
</tbody>
</table>

### 4. Contribution to national strategic priorities and policy

**CC CSP, NSDP, NDC, SDG**
- Zero hunger

### 5. Transformative, innovation and replication potential of the project, partnership and co-finance arrangements

IFA-D funding programs
- DPs-Programs (WB, ADB, AusAID)

©FAO
# Climate-Smart Sustainable Rice Landscapes

## Project Concept

**Project / programme title:** Implementing AWD+ approach in irrigated paddy field in Bojonegoro Regency (east Java) and Karanganyar regency (central Java) and Subang Regency (West Java)

**Proposed Executing Agencies:**
- Ministry of Agriculture – IRRI University
- Subang Regency (West Java)

**Main Beneficiaries:** Farmer, LG, Researcher

**Proposed funding (in USD):** 900,000 USD

**Climate Action Gap Addressed:** Capacity building, RD&E

<table>
<thead>
<tr>
<th>Focus</th>
<th>Emissions Reduction</th>
<th>Adapation</th>
<th>Cross-cutting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Change and environmental baseline, problems and root causes (for national situations and the targeted landscapes)</td>
<td>- High emission&lt;br&gt;- Low water efficiency&lt;br&gt;- High pesticide&lt;br&gt;- High, imbalance fertilizer application</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Barriers | Water control electricity<br>- Low awareness, funding mechanism<br>- weed |

## 2. Proposed Project

### Outcomes

- Decreased emission
- Decreased chemical use (fertilizer: urea; pesticide)
- Emission data
- Crop yield
- Crop performance data
- dem-farm
- Treatment testing
- Farmer field school
- Manual guide book writing

### Activities

#### Value

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)</td>
<td></td>
</tr>
<tr>
<td>Area of land restored (Million Hectares)</td>
<td></td>
</tr>
<tr>
<td>Area of landscapes under improved practices (excluding protected areas) (Million Hectares)</td>
<td></td>
</tr>
<tr>
<td>Total area under improved management (Million Hectares)</td>
<td>15 ha</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions Mitigated (million metric tons of CO2e)</td>
<td>300 metric tons of CO2e</td>
</tr>
<tr>
<td>Number of shared water ecosystems (fresh or marine) under new or improved cooperative management</td>
<td></td>
</tr>
<tr>
<td>Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment</td>
<td></td>
</tr>
</tbody>
</table>

### 4. Contribution to national strategic priorities and policy

- Emission reduction 30%
- Recommended rice variety for given areas (regencies)

### 5. Transformative, innovation and replication potential of the project, partnership and co-finance arrangements

- Co-finance with LG
- Recommended variety

©FAO
<table>
<thead>
<tr>
<th>1. Project / Programme Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project / programme title</strong></td>
</tr>
<tr>
<td><strong>Proposed Executing Agencies</strong></td>
</tr>
<tr>
<td><strong>Main Beneficiaries</strong></td>
</tr>
<tr>
<td><strong>Proposed funding (in USD)</strong></td>
</tr>
<tr>
<td><strong>Climate Action Gap Addressed</strong></td>
</tr>
<tr>
<td><strong>Focus</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Climate Change and environmental baseline, problems and root causes</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Proposed Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcomes</strong></td>
</tr>
<tr>
<td>Upgrade R &amp; C on agriculture</td>
</tr>
<tr>
<td>Promote appropriate technology on M&amp;A</td>
</tr>
<tr>
<td>Improve farmers livelihood and better</td>
</tr>
<tr>
<td>Cope with CC environment benefit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Potential Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Value</strong></td>
</tr>
<tr>
<td>Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)</td>
</tr>
<tr>
<td>Area of land restored (Million Hectares)</td>
</tr>
<tr>
<td>Area of landscapes under improved practices (excluding protected areas)(Million Hectares)</td>
</tr>
<tr>
<td>Total area under improved management (Million Hectares)</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions Mitigated (million metric tons of CO2e)</td>
</tr>
<tr>
<td>Number of shared water ecosystems (fresh or marine) under new or improved cooperative management</td>
</tr>
<tr>
<td>Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Contribution to national strategic priorities and policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to national policy goals and international obligations, e.g. GHG emissions under the Paris Agreement</td>
</tr>
<tr>
<td><strong>Value</strong></td>
</tr>
<tr>
<td>ADS, NDC, NSCC, CCA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Transformative, innovation and replication potential of the project, partnership and co-finance arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium – high</td>
</tr>
<tr>
<td>PPP, GCF, GEF, FAO</td>
</tr>
</tbody>
</table>

©FAO
# Climate-Smart Sustainable Rice Landscapes

## Project Concept

### 1. Project / Programme Information

**Project / programme title:** Climate smart Granary - Water & straw management

**Proposed Executing Agencies:** MoA, MESTECC, MADA, MARDI, NAHRIM, KATS, DID, DOA

**Main Beneficiaries:** Farmers, MADA, State Government

**Proposed funding (in USD):** 8 million

**Climate Action Gap Addressed:** Research → Policy → Implementation → Marketing

**Focuses:**
- Emissions Reduction
- Stopping Land degradation
- Adaptation
- Enhancing Biodiversity
- Cross-cutting
- Reducing chemical use

**Climate Change and environmental baseline, problems and root causes:**
- GHG: Current practices
- Water Management: Increasing sector demand
- Deforestation: Stable income

**Barriers:** Information, financial, attitude

### 2. Proposed Project

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outputs and/or main deliverables</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG</td>
<td>inventory</td>
<td>R &amp; D Capacity building Extension programme</td>
</tr>
<tr>
<td>Adaptation options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity/income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biodiversity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3. Potential Targets

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)</td>
<td>&gt;100 sq. km</td>
</tr>
<tr>
<td>Area of land restored (Million Hectares)</td>
<td>~100,000 ha</td>
</tr>
<tr>
<td>Area of landscapes under improved practices (excluding protected areas) (Million Hectares)</td>
<td>100k ha.</td>
</tr>
<tr>
<td>Total area under improved management (Million Hectares)</td>
<td>50k – 100k</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions Mitigated (million metric tons of CO2e)</td>
<td>35% (baseline)</td>
</tr>
<tr>
<td>Number of shared water ecosystems (fresh or marine) under new or improved cooperative management</td>
<td>2 main river systems</td>
</tr>
<tr>
<td>Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment</td>
<td>50,000 farmers (70m: 30f)</td>
</tr>
</tbody>
</table>

### 4. Contribution to national strategic priorities and policy

1. National agrifood policy
2. National CC policy
3. National/ UNFCCC National Communication
4. Water Resources policy/ biodiversity policy

### 5. Transformative, innovation and replication potential of the project, partnership and co-finance arrangements

Replicates to other granaries area
- ASEAN

©FAO
# Climate-Smart Sustainable Rice Landscapes
## Project Concept

### 1. Project / Programme Information

<table>
<thead>
<tr>
<th>Project / programme title</th>
<th>Capacity building for climate smart sustainable rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Executing Agencies (lead national government institutions and main technical partners)</td>
<td>MOAUL (DOA, YAU, DAR)</td>
</tr>
<tr>
<td>Main Beneficiaries</td>
<td>Farmers, technicians, staffs</td>
</tr>
<tr>
<td>Proposed funding (in USD)</td>
<td>Project / programme life span</td>
</tr>
<tr>
<td>Climate Action Gap Addressed</td>
<td>Knowledge, technical know how</td>
</tr>
<tr>
<td>Focuses</td>
<td>Emissions Reduction $\triangle$</td>
</tr>
<tr>
<td></td>
<td>Stopping Land degradation $\triangle$</td>
</tr>
<tr>
<td></td>
<td>Adaptation $\triangledown$</td>
</tr>
<tr>
<td></td>
<td>Enhancing Biodiversity $\triangledown$</td>
</tr>
<tr>
<td></td>
<td>Cross-cutting $\triangledown$</td>
</tr>
<tr>
<td></td>
<td>Reducing chemical use $\triangledown$</td>
</tr>
<tr>
<td>Climate Change and environmental baseline, problems and root causes (for national situations and the targeted landscapes)</td>
<td>Rice landscapes</td>
</tr>
<tr>
<td></td>
<td>GHG emission from rice</td>
</tr>
<tr>
<td>Barriers (Key barriers preventing government, farmers, corporate etc. addressing the above key problems)</td>
<td>Technology, finance, resource person</td>
</tr>
<tr>
<td></td>
<td>Used traditional practices</td>
</tr>
<tr>
<td></td>
<td>Poor assessment</td>
</tr>
</tbody>
</table>

### 2. Proposed Project

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outputs and/or main deliverables</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Manual &amp; guideline</td>
<td>- Increasing production</td>
<td>- Capacity building (staff, farmers)</td>
</tr>
<tr>
<td>- Policy suggestion report</td>
<td>- GHG reduction</td>
<td>- Farmer field school</td>
</tr>
<tr>
<td></td>
<td>- Sustainable land management</td>
<td>- Training (foreign/local)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Fields day Demonstration</td>
</tr>
</tbody>
</table>

### 3. Potential Targets

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)</td>
<td>3 million ha</td>
</tr>
<tr>
<td>Area of land restored (Million Hectares)</td>
<td>0.5M ha</td>
</tr>
<tr>
<td>Area of landscapes under improved practices (excluding protected areas) (Million Hectares)</td>
<td>1M ha</td>
</tr>
<tr>
<td>Total area under improved management (Million Hectares)</td>
<td>1M ha</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions Mitigated (million metric tons of CO2e)</td>
<td>0.7 MMt</td>
</tr>
<tr>
<td>Number of shared water ecosystems (fresh or marine) under new or improved cooperative management</td>
<td>30% of total cultivated area</td>
</tr>
<tr>
<td>Number of direct beneficiaries disaggregated by gender as co-beneficiary of GEF investment</td>
<td>4000 farmers</td>
</tr>
</tbody>
</table>

### 4. Contribution to national strategic priorities and policy

- Contribution to national policy goals and international obligations, e.g., GHG emissions under the Paris Agreement: medium

### 5. Transformative, innovation and replication potential

- Potential of the project partnership and co-finance arrangements: Higher
- PPP: 40%
### 1. Project / Programme Information

- **Project / programme title:** Outsourcing of AWI in Two National Irrigation System in the Philippines
- **Proposed Executing Agencies:**
  - DA – PhilRice
  - N/A, ATI, DA-RFO 2 & 3
- **Main Beneficiaries:** Farmer, LG, Researcher
- **Proposed funding (in USD):** 2.5M
- **Climate Action Gap Addressed:** Capacity building, RD & E
- **Focus:**
  - Emissions Reduction □
  - Adaptation □
  - Cross-cutting □
- **Climate Change and environmental baseline, problems and root causes:**
  - Water scarcity (siltation, drought)
  - Increase use of herbicides
- **Barriers:**
  - Institutional arrangement
  - Fund
  - No clear incentive of farmers
  - Low buy in by farmers and (local) farming communities

### 2. Proposed Project

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outputs and/or main deliverables</th>
<th>Activities</th>
</tr>
</thead>
</table>
| - Increased area irrigated | - At least 50% area increased | 1. Capacity building / FFS
| - Increased cropping intensity (production) | - 14 million CO₂-e reduced | 2. Instrumentation
| - Increased income | | 3. MRV
| - Reduced GHG emission | | 4. Payment or incentive
| &nbsp; | | 5. Conduct of baseline survey ground working

### 3. Potential Targets

- Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)
- Area of land restored (Million Hectares)
- Area of landscapes under improved practices (excluding protected areas) (Million Hectares)
- Total area under improved management (Million Hectares)
- Greenhouse Gas Emissions Mitigated (million metric tons of CO₂e)
- Number of shared water ecosystems (fresh or marine) under new or improved cooperative management
- Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

### 4. Contribution to national strategic priorities and policy

- **Support to CC program/ policy of the government**
  - Outscaling to all other types of irrigation system
  - PPP

©FAO
# Climate-Smart Sustainable Rice Landscapes

## Project Concept

### 1. Project / Programme Information

<table>
<thead>
<tr>
<th>Project / programme title</th>
<th>Integrate Rice Base Farming System (landscape area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Executing Agencies (lead national government institutions and main technical partners)</td>
<td>RD, BAAC, (MOAC), RID, LDD, DOF, DOA, MOC</td>
</tr>
<tr>
<td>Main Beneficiaries</td>
<td>Farmer community</td>
</tr>
<tr>
<td>Proposed funding (in USD)</td>
<td>10M</td>
</tr>
<tr>
<td>Project / programme life span</td>
<td>5 years</td>
</tr>
<tr>
<td>Climate Action Gap Addressed</td>
<td>1. Water management, 2. climate smart ext, 3. marketing linkage</td>
</tr>
<tr>
<td>Focus</td>
<td>Emissions Reduction ⬤, Adaptation ⬤, Cross-cutting ⬤, Stopping Land degradation ⬤, Enhancing Biodiversity ⬤, Reducing chemical use ⬤</td>
</tr>
<tr>
<td>Climate Change and environmental baseline, problems and root causes (for national situations and the targeted landscapes)</td>
<td>Irrigated and rain-fed rice areas, Database, not fully impairment</td>
</tr>
<tr>
<td>Barriers (Key barriers preventing government, farmers, corporate etc. addressing the above key problems)</td>
<td>Farmer knowledge, Water management system not fully manage, Market link, + IOT</td>
</tr>
</tbody>
</table>

### 2. Proposed Project

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outputs and/or main deliverables</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable</td>
<td>Increase yield by 10%</td>
<td>Integrated farming system</td>
</tr>
<tr>
<td>New market sys.</td>
<td>Income</td>
<td>Intensive farmer training</td>
</tr>
<tr>
<td>Water management sys.</td>
<td>Quality of life</td>
<td>Provide infrastructure (pond, so)</td>
</tr>
<tr>
<td>Smart farmer</td>
<td>Better environment</td>
<td>Data base (develop)</td>
</tr>
<tr>
<td>Benefits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3. Potential Targets

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)</td>
</tr>
<tr>
<td>Area of land restored (Million Hectares)</td>
</tr>
<tr>
<td>Area of landscapes under improved practices (excluding protected areas)(Million Hectares)</td>
</tr>
<tr>
<td>Total area under improved management (Million Hectares)</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions Mitigated (million metric tons of CO2e)</td>
</tr>
<tr>
<td>Number of shared water ecosystems (fresh or marine) under new or improved cooperative management</td>
</tr>
<tr>
<td>Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment</td>
</tr>
</tbody>
</table>

### 4. Contribution to national strategic priorities and policy

| NDC (future) |
| MOAE strategy |

### 5. Transformative, innovation and replication potential of the project, partnership and co-finance arrangements

| Potential to transform and replicate the hold rice |
| Ares |

©FAO
# Climate-Smart Sustainable Rice Landscapes

## Project Concept

### 1. Project / Programme Information

<table>
<thead>
<tr>
<th>Project / programme title</th>
<th>C.S.S.R.L in RRD &amp; neighbor landscapes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Executing Agencies</td>
<td>MARD, VAAS, IAE, Research Institute</td>
</tr>
<tr>
<td>(lead national government institutions and main technical partners)</td>
<td>IT x Industry company Hue University IRRI</td>
</tr>
<tr>
<td>Main Beneficiaries</td>
<td>Former MONRE MARD Province rice producer</td>
</tr>
<tr>
<td>Proposed funding (in USD)</td>
<td>50M</td>
</tr>
<tr>
<td>Climate Action Gap Addressed</td>
<td>GHG emission assessment, climate smart technology</td>
</tr>
<tr>
<td>Focus</td>
<td>Emissions Reduction □ □ , □ □ □ □ □ □ □</td>
</tr>
<tr>
<td>Climate Change and environmental baseline, problems and root causes (for national situations and the targeted landscapes)</td>
<td>Land degradation □ □ □ □ □ □ □</td>
</tr>
<tr>
<td>Barriers</td>
<td>Database, technical guideline</td>
</tr>
<tr>
<td>(Key barriers preventing government, farmers, corporate etc. addressing the above key problems)</td>
<td>Unsustainable livelihood, small field size</td>
</tr>
<tr>
<td></td>
<td>Upscaling new technology</td>
</tr>
</tbody>
</table>

### 2. Proposed Project

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outputs and/or main deliverables</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livelihood</td>
<td>RRDLS master plan</td>
<td>1. Develop DB for rice based landscape</td>
</tr>
<tr>
<td>Sustainable rice landscape</td>
<td>capacity building</td>
<td>2. Pilot rice base landscape (low emission rice, rice fish)</td>
</tr>
<tr>
<td>GHG</td>
<td>mechanize</td>
<td>3. Rice base LS planning/ policy</td>
</tr>
<tr>
<td></td>
<td>soil fertility</td>
<td>4. Design agrobusiness to according to landscape approaches</td>
</tr>
<tr>
<td></td>
<td>Rice farmer income</td>
<td>5. Scaling up/ out good pilot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Value chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. LCA</td>
</tr>
</tbody>
</table>

### 3. Potential Targets

| Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares) | 3M |
| Area of land restored (Million Hectares) | 1.5M |
| Area of landscapes under improved practices (excluding protected areas)(Million Hectares) | 3.0M |
| Total area under improved management (Million Hectares) | 0.5M |
| Greenhouse Gas Emissions Mitigated (million metric tons of CO2e) | 5M |
| Number of shared water ecosystems (fresh or marine) under new or improved cooperative management | 2 |
| Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment | 1M |

### 4. Contribution to national strategic priorities and policy

| NDC 2025 ( □ 25% GHG) |

### 5. Transformative, innovation and replication potential of the project, partnership and co-finance arrangements

| Whole country + ASEAN |
Annex 3 Participants List

CAMBODIA

Dr Koy Ra
Member of MAFF’s Technical Working Group on Climate Change for Agriculture, Forestry and Fisheries “TWG-CCAFF”
Deputy Director,
Director of Agri Land Resource Management,
General Directorate of Agriculture,
MAFF

Dr Seng Vang
Member of MAFF’s Technical Working Group on Climate Change for Agriculture, Forestry and Fisheries “TWG-CCAFF”
Deputy Director,
Cambodian Agricultural Research Development Institute (CARDI)/MAFF

Ms Vichet Ratha Khlok
Deputy Director
Organization (department/ministry): Department of Climate Change, General Secretariat of National Council for Sustainable Development/
Ministry of Environment

Mr. Chin Da
Deputy Director of Aquaculture Department

INDONESIA

Mr Eko Prasondita
Head of section for mitigation of climate changes tools of the directorate of climate change mitigation
Ministry of environment and forestry

Ms Eni Yulianingsih
Researcher
Center for Agricultural Environmental Research
Indonesian Agency for Agricultural Research and Development

LAO PDR

Dr Inthavong Thavone

Director of Research Centre for Climate Change Resilience in Agriculture (RCRA)
National Agriculture, Forestry and Rural Development (NAFRI)

Bounthee Saythongvanh (Thee)
Deputy Director of Division,
Department of Climate Change (DCC)
Ministry of Natural Resources and Environment

Ban Sisavath

Ms. Phounxap Soysouvanh
Technician
Plant Protection Center, Department of Agriculture, Ministry of Agriculture and Forestry

MALAYSIA

Mr. Zamrizam Bin Samsuri
Principal Assistant Secretary,
Paddy and Rice Industry Division,
Ministry Of Agriculture And Agro-Based Industry

Mr. Mohd Fahmi Bin Mokhy
Assistant Secretary,
Policy and Strategic Planning Division (GEF 7)
Ministry of Agriculture and Agro-Based Industry

Dato’ Dr. Mohamad Zabawi Abdul Ghani
Director of Agrobiodiversity Research Center and Environment,
Malaysian Agricultural Research and Development Institute

Mohd Hasmady bin Ghazali
Agriculture Office
Department of Agriculture

Nor Hafizah Binti Abd Rahman
Agriculture Office
Department of Agriculture

MYANMAR

Ms. Sabai Lwin
Assistant Director
Department of Meteorology and Hydrology,
Ministry of Transport and Communication

Ms Khin Khin Swe
Deputy Director
Environmental Conservation Department (ECD),
Ministry of Natural Resources and Environmental Conservation (MoNREC)

Mrs. Wa Wa Thein
Deputy Director
Land Use Division, Department of Agriculture,
Ministry of Agriculture

PHILIPPINES

Ms Vilma Villegas Garcia
Chief
Planning and Management Division
Department of Environment and Natural Resources

Mr. Wilfredo B. Collado
Supervising Science Research Specialist
Agronomy, Soils, and Plant Physiology Division

U-Nichols Asis Manalo
Director-Coordinator, DA Systems-Wide Climate Change Office, Department of Agriculture, Philippines

Engr. Kristine S. Pascual
Senior Science Research Specialist
Rice Engineering and Mechanization Division, PhilRice

THAILAND

Dr Phirun Saiyasitpanich
Director
Thailand Climate Change Management and Coordination Division and UNFCCC Focal Point,
Office of Natural Resources and Environmental Policy and Planning Ministry of Environment and Natural Resources

Ms. Duangporn Vitthoonjit
Chai Nat Rice Research Center

Mr Thitipong Srisombut
Economist
Office of Agricultural Economics
Ministry of Agriculture and Cooperatives

Mr Chitnucha Buddhaboon
Director
Ubon Ratchathani Rice Research Center

Mr. Pitayakon Limtong
Director of Office of Royal Initiated Project,
Land Development Department.
Ministry of Agriculture and Cooperatives, Bangkok, Thailand

Ms Preeyarat Chailangka
Soil Scientist
Office of Land Use Planning and Policy,
Land Development Department, Thailand

Mr. Parinya Changseetha
Office of Natural Resources and Environmental Policy and Planning

Dares Kaewket
Environmentalist Professional level ONEP

Mr Suwat Piampajjai
Deputy Director
Department of Water Resources

Ms. Parichat Borkhum
Department of Water Resources Management

Kittima Jintanasonti
Plan and Policy Analyst,
Professional Level
Office of Agricultural Economics

Ms Areerat Anuchon
Senior Professional Hydrologist
Sediment and Water Quality Group, Hydrology Division
Office of Water Management and Hydrology Royal Irrigation Department

Ms. Sukanda Chuersuwan
Environmentalist Professional Level
Department of Water Resource

Ms. Parichat Borkhum

VIET NAM

Ms. Le Hoang Anh
Senior Officer
Department of Science, Technology and Environment, in charge of NDC for agriculture sector.
Mr. Tran Van The  
Deputy Director General  
Institute for Agricultural Environment, VAAS, team leader for a research to identify options for adaptation and mitigation for rice in Viet Nam

Ms Nguyen Thu Phuong  
Senior Official  
Department of Water Resources Management  
Ministry of Natural Resources and Environment

RESOURCE PERSONS

Mr. Viengsavanh Phimphachanhvongsod  
Director of Planning and Cooperation Division  
National Agriculture and Forestry Research Institute (NAFRI)

Mr. Chanthaboun Sirimanotham  
Deputy Director General  
Department of Livestock and Fisheries

Dr. Yiyi Sulaeman  
Deputy Director  
Agency for Agricultural Research and Development, Center for Agricultural Research and Development  
Ministry of Agriculture

Ms. Imelda Bacudo  
Principal Advisor  
Asean Climate Resilience Network, Setiabudi Residence, Asean-German Programme on Response to Climate Change (GAP-CC) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Jakarta, Indonesia

James M. Roshetko, PhD  
Leader Trees, Agroforestry Management and Market Unit  
World Agroforestry Centre  
Southeast Asia Regional Program

Dr Margaret Yoovanata  
Senior Policy and Plan Specialist  
Planning and Technical Division  
Department of Agriculture, Ministry of Agriculture and Cooperatives (MOAC)  
Thailand

Mr Mohd Zaki bin Mat Amin  
Director of Water Resources and Climate Change Centre  
National Hydraulic Research Institute Malaysia (NAHRIM); Ministry of Water, Land and Natural Resources (KATS)

Mr Man Purotaganon  
Head of Secretariat Office, Steering Committee  
Member of the GWP, Thai Water Partnership Foundation

Mr Arief Lukman Hakim  
FIELD Indonesia

Mr Mohd Adnan bin Mohd Nor  
Resource Person (Irrigation and Water Resources)  
Malaysian National Committee on Irrigation and Drainage (Mancid)

OLAM

Paul Nicholson  
VP, Rice Research and Sustainability  
OLAM  
Singapore

INIA Chile

Sara Hube Santana  
Senior Researcher in Climate Change, Greenhouse Gas Emissions  
Agricultural Research Institute of Chili  
Chile

Viviana Becerra  
Senior Researcher in Rice Genetics & Agronomy  
INIA  
Chile

CAAS China

QIN Xiaobo  
Associate Professor  
Institute of Environment and Sustainable Development in Agriculture, Chinese Academy of Agricultural Sciences  
China
Wan Yunfan
Associate Professor
Institute of Environment and Sustainable Development in Agriculture, Chinese Academy of Agricultural Sciences

IAERI Indonesia

Mr. Ali Pramono
Agricultural Environment Research Institute

Helena Lina Susilawati
Researcher Indonesian Agricultural Environment Research Institute

Terry Ayu Adriani
Researcher Indonesian Agricultural Environment Research Institute

MoMAF Indonesia

Mr. Tajuddin Idris
Directorate of Aquaculture Production and Business, Directorate General Ministry of Marine Affairs and Fisheries

EDF

Richie Ahuja
Regional Director, Asia EDF

Kritee Kritee
Senior Scientist EDF

Hayden Montgomery
EDF

University of Western Australia

Prof. Andrew Whiteley
Professor
School of Agriculture and Environment, Faculty of Science, University of Western Australia

Dr Suman George
Research Fellow

School of Agriculture and Environment, Faculty of Science, University of Western Australia

WBCSD

Tony Siantonas
Manager
Climate Smart Agriculture
WBCSD

Mathew Reddy
Director, Forest Solutions Group & Climate Smart Agriculture
WBCSD

USDA

Ashley Nelson
International Relations Advisor on Climate Change
U.S. Department of Agriculture

CGIAR

Don Griffiths
Project Manager
Myanmar Sustainable Aquaculture Programme – Inland

JATAFF (Contractor of APEC)

Akira Nagata
General Manager, Innovation Division
Japan Association for Techno-innovation in Agriculture, Forestry and Fisheries (JATAFF)

MAFF

Ichiro Nakagawa
Director, Environment Policy Office, Policy Planning Division
MAFF

Michihiro Higuchi
Deputy Director, Environment Policy Office
Policy Planning Division
MAFF

Koichiro Nishihata
International Research Expert
International Research
MAFF

NARO

Yasuhito Shirato
Director,
Climate Change Research Division
NARO

Yasukazu Hosen
Co-chair of rice research group
GRA

JIRCAS

Naruo Matsumoto
Representative,
Southeast Asia Liaison Office
JIRCAS

Dr. Kazunori Minamikawa
Senior Researcher
Crop, Livestock and Environment Division
JIRCAS

IRRI

David Johnson
IRRI Representative for South East Asia
IRRI

Thuong Thi Bach
Senior researcher
IRRI

Dr. Bjoern Ole Sander
IRRI

Dr Rainer Wassmann
Senior Scientist and Climate Change Specialist
Crop and Environmental Sciences Division,
International Rice Research Institute

IAE Viet Nam

Pham Quang Ha
Deputy Director General
Institute for Agricultural Environment

Vu Duong Quynh
Deputy Head Department of Environmental Chemistry
Institute for Agricultural Environment

Hue University of Agriculture and Forestry
/ Viet Nam

Dong Thi Hoang Tran
Lecturer
Hue University of Agriculture and Forestry

Ly Hai Hoang
Lecturer
Hue University of Agriculture and Forestry

Nghia Trong Hoang
HUAF

Ms. Chau Thi Tuyet Hanh

Sukanda Chuersuwan
Environmentalist Professional level
Department of water resources

JGSEE

Kazuyuki Yagi
Professor
JGSEE

Sirintornthep Towprayoon
Professor JGSEE

Dr. Amnat Chidthaisong
Professor
JGSEE

Patiorn Sriphirom
Ph.D. Student
JGSEE

Nittaya Cha-un
Post-doc researcher

Ms. Kanlayanee Fusuwankaya