Issue 21
December 30, 2024

NEWSLETTER

Smart & Net-Zero Project

Overview

The Smart Net-Zero (SNZ) project team under the Food and Fertilizer Technology Center (FFTC) for the Asian and Pacific Region regularly collects and shares information related to sustainable agrifood systems and climate-smart agriculture, including research, news, policy, data and event updates around the world on the project website.

Rice feeds 50% of the world's population, but meeting a 40% demand increase by 2030 is challenging. Rice production accounts for 9-11% of agricultural GHG emissions, with CH_4 and N_2O as major contributors. Asia, producing 75% of global rice, faces water scarcity as rice consumes 45% of its freshwater. Urgent adoption of sustainable practices is crucial to balance productivity with environmental concerns. **This issue explores GHG mitigation technologies to achieve sustainable rice production, focusing on water, fertilizer and tillage management.** It highlights practices such as alternate wetting and drying (AWD), optimized land preparation and fertilization techniques, improved rice cultivars, and the incorporation of biochar or straw removal for utilization beyond the fields to improve resource efficiency and reduce net emissions from rice systems. However, the trade-offs of AWD and straw removal on soil organic carbon need to be studied.

https://net.fftc.org.tw/smartnetzero *www.fftc.org.tw*

Content

RESEARCH

01 THEME: GHG emission reduction; Carbon sequestration

Opportunities for mitigating net system greenhouse gas emissions in Southeast Asian rice production: A systematic review

February 28, 2024 | Agriculture, Ecosystems & Environment | Source |

Introduction: Southeast Asia (SEA) produces 28% of global rice. As flooded rice fields account for nearly half of global crop-related greenhouse gases, particularly methane (CH_4), climate-smart strategies are urgently needed to enhance productivity, resource efficiency, and environmental sustainability. Despite existing mitigation efforts, integrated approaches addressing system-wide emissions—including soil organic carbon (SOC), energy use, and residue management—remain underexplored. This systematic review, conducted by researchers from the University of California Davis (USA), IRRI (Philippines), and INIA Uruguay, synthesizes scientific evidence across four components using a net system emissions framework. The study assesses cross-component effects and highlights effective mitigation opportunities critical for sustainable rice practices in SEA amidst growing global climate commitments.

Key findings: The study identifies key opportunities for mitigating net GHG emissions in SEA rice production across four components:

- **Field GHG Emissions:** Effective mitigation strategies include alternate wetting and drying (AWD) irrigation, mid-season drainage, straw removal or burning, and biochar application. These methods significantly reduce CH_4 emissions but may increase nitrous oxide (N_2O) emissions or lower SOC, requiring balanced management.
- **Energy Inputs:** Synthetic nitrogen fertilizers and fossil fuels are major emission sources. Mitigation strategies involve optimized fertilization through site-specific nutrient management, alternative nutrient sources like biochar, and reduced water-intensive irrigation methods such as AWD.
- **Residue Utilization:** Removing rice straw from fields to prevent open burning significantly reduces GHG emissions. Opportunities include repurposing residues for energy production, such as electricity or bioethanol, which offsets fossil fuel emissions and enhances energy efficiency.
- **Soil Organic Carbon (SOC):** Practices like biochar application, residue incorporation, and compost enhance SOC stocks, offsetting emissions. Biochar shows significant soil carbon gains, but high application rates may present practical challenges. Long-term research is needed to understand the combined effects of practices like drainage and straw removal.

The review emphasizes the importance of integrated approaches that address cross-component synergies and trade-offs. While field GHG emissions and SOC changes offer the largest mitigation potential, strategies like water and carbon management often involve trade-offs, such as SOC reductions from drainage. Long-term research is crucial to optimize integrated practices, balancing emissions reductions and SOC preservation effectively.

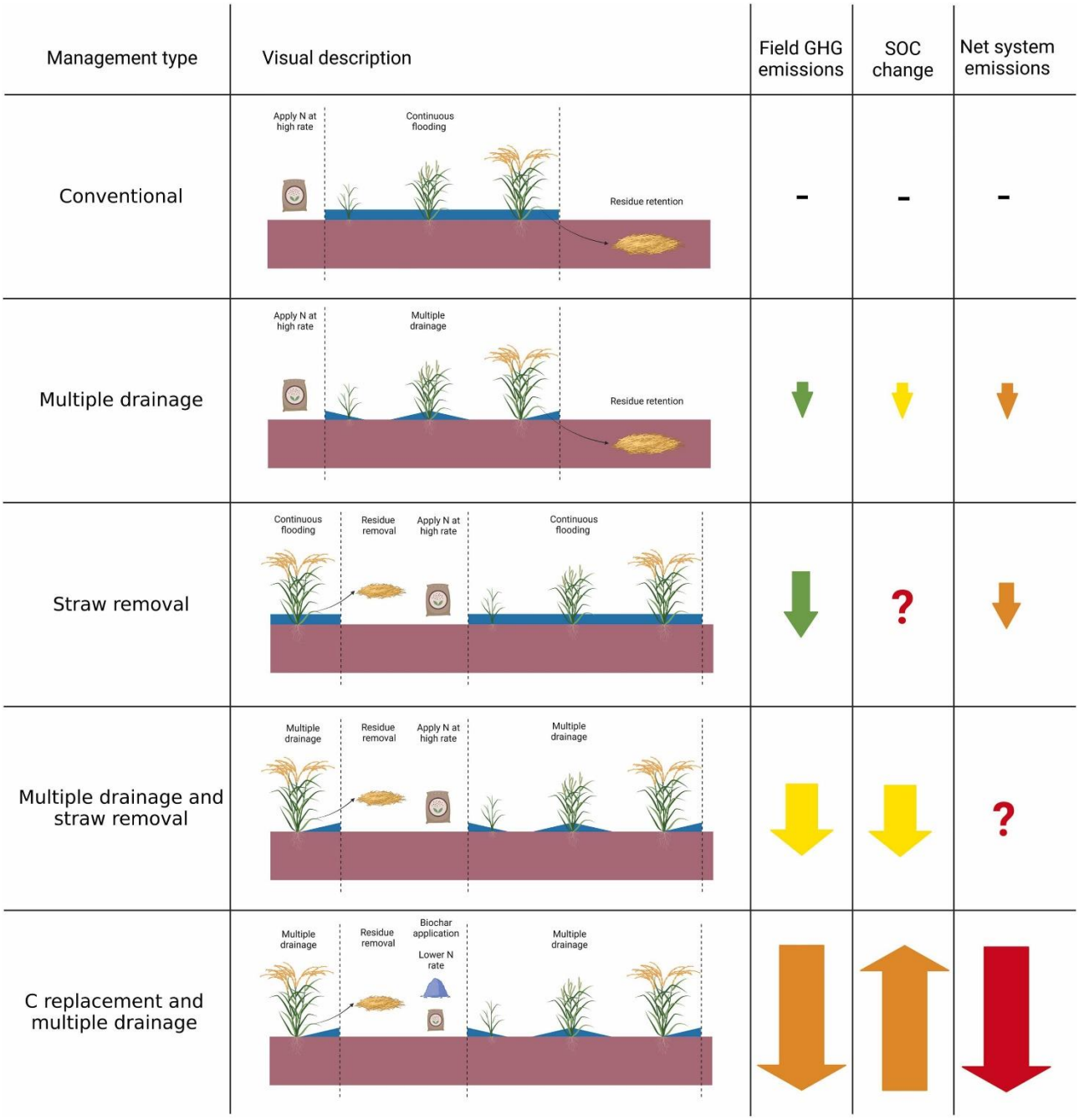


Figure | Conceptual figure summarizing the relative impact of four mitigation strategies (multiple drainage, straw removal, multiple drainage and straw removal, and C replacement and multiple drainage) on the components of field GHG emissions, SOC change, and net system emissions compared to a conventional baseline. A visual description of the scenario is shown together with arrows that show the approximate magnitude (size of arrow), likely directionality, and confidence level of its impact. For visual descriptions with a previous season, it is done so to highlight residue management impacts on emissions in the next season. Downward pointing arrows suggest a decrease in field GHG emissions, a decrease in SOC, and a decrease in net system emissions. The confidence level is shown through color: Green (confident), light yellow (somewhat confident), orange (somewhat confident but with little data supporting), red (somewhat confident but no empirical verification). A question mark shows knowledge gaps large enough that no conclusions can be drawn. This figure was created with BioRender.com.

02 THEME: GHG emission reduction

A meta-analysis on the mitigation measures of methane emissions in Chinese rice paddy

March, 2024 | Resources, Conservation and Recycling | Source |

Introduction: China being the largest rice producer, representing 21.75% of global methane (CH_4) emissions from rice cultivation, thus mitigating methane emissions is critical for both domestic and global climate objectives. While past studies explored individual practices, gaps persist in understanding the heterogeneity of outcomes and the combined effects of existing mitigation measures. This study, conducted by a multidisciplinary research team from Chinese academia, employs a meta-analysis to evaluate 10 mitigation strategies using field data to address the effectiveness as well as regional variability.

Key findings: The study assessed the effects of 10 CH_4 mitigation measures on emissions and rice yields, included water management (intermittent irrigation, AWD, winter drainage), fertilizer management (e.g., deep placement, biochar, urea with additives), agricultural practices (new rice varieties, cultivation techniques), and integrated water-fertilizer systems.

- **Water Management:** Intermittent irrigation, AWD and winter drainage techniques significantly reduce methane emissions by 43.83%, 38.99%, and 40.24% respectively, while boosting water productivity, enhancing nutrient absorption and thus in elevated yields. Despite these benefits, increased N_2O emissions and reduced soil carbon sequestration present challenges.
- **Fertilizer Management:** Nutrient management technologies such as CRU (polymer-coated controlled release urea), NU (urea with N-Sever nitrapyrin), DMPP (urea with 3,4-dimethylpyrazole phosphate), EM (urea with effective microorganisms) and deep placement treatments can reduce excessive fertilizer use, improving nitrogen utilization efficiency, thus mitigating methane emissions by up to 32.49% and boosting yields by 6.46%. However, high cost and variance in outcomes limit their adoption in rice farming. Other techniques like biochar cut emissions by 31.51% while enhance soil quality and lead to higher yields, the methane reduction effect increases overtime.
- **Tillage Management:** New rice varieties, direct-seeding, plastic mulching, and symbiosis ecosystems can collectively lower methane emissions and improve yields at various levels. High-yield, drought-resistant varieties and ecological practices could enhance nutrient cycling, yet direct-seeding methods might face challenges like increased herbicide use and disease risks.

In addition, the meta-analysis reveals that water-fertilizer coupling management outperforms single measures and is the most effective methane mitigation strategy, achieving a 67.27% reduction while enhancing crop yields. Followed by water management, tillage management, and fertilizer management. Multiple studies affirmed that water management is pivotal in methane mitigation in rice fields. Methane mitigation in rice paddies is further influenced by factors like rice variety, climate, soil pH, precipitation, and cultivation methods, with multivariate analysis showing stronger

impacts than single-factor studies, highlighting the need for region-specific, multifactor policy approaches to enhance emission reduction effectiveness.

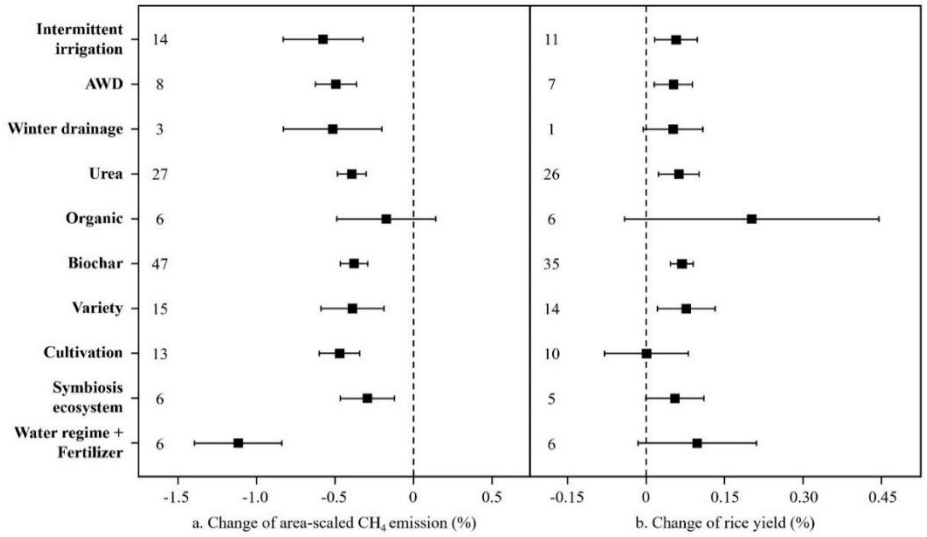


Figure | Results of meta-analysis on the responses of area-scaled CH4 emission (a) and rice yield to changes (b) in mitigation management.

03 THEME: GHG emission reduction

Mitigation of greenhouse gas emissions and reduced irrigation water use in rice production through water-saving irrigation scheduling, reduced tillage and fertiliser application strategies

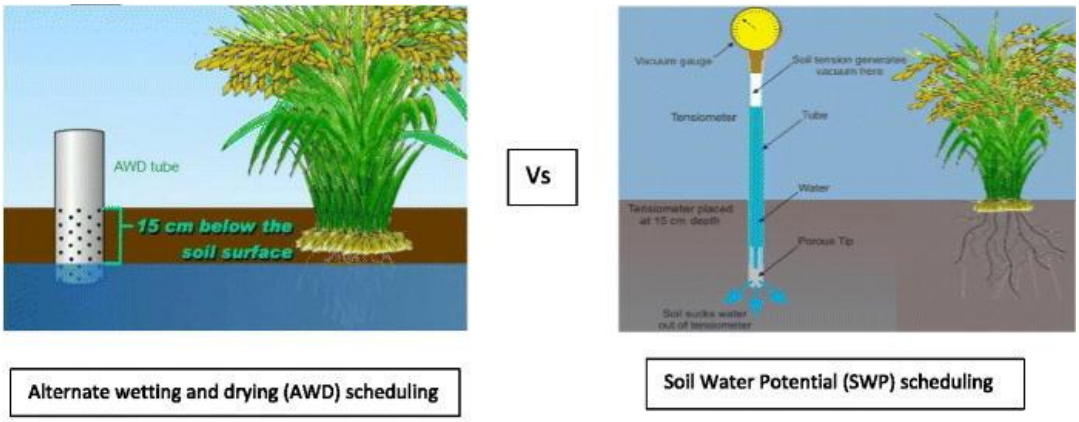
October 15, 2020 | Science of The Total Environment | Source |

Introduction: Rice production in Asia accounts for 75% of the global supply but is highly vulnerable to climate change, with rising temperatures, altered rainfall, and increased weeds, pests, and diseases potentially reducing yields by up to 50% by 2100 without effective mitigation and adaptation strategies. Developing sustainable agronomic technologies is therefore crucial to enhance productivity and resource-use efficiency in rice farming. This study examined the effects of water-saving irrigation practices (safe alternate wetting and drying, AWD vs. soil water potential scheduling, SWP), land preparation methods (puddling vs. non-puddled reduced tillage), and fertilizer application techniques (broadcast vs. liquid fertilization) on water-use efficiency, GHG emissions, and rice yield. Conducted in the Philippines by researchers from Wageningen University, the University of Copenhagen, IRRI, and ACIAR, the randomized complete block experiment included eight treatments combining the above three factors, with four replicates, to evaluate sustainable rice production practices.

Key findings: The results showed that Broadcast-AWD achieved the highest yield, 20% more than Liquid fertilizer-AWD, while Broadcast-SWP delivered comparable yields with 15% less water use. Liquid fertilizer under SWP showed lower yields due to nitrogen leaching and limited uptake, whereas reduced tillage under SWP saved additional water during land preparation. Methane (CH_4) emissions were 73–86% lower in AWD and SWP compared to conventional flooded systems. SWP reduced CH_4 emissions by 33% compared to AWD, aided by improved soil aeration and fewer flooding periods. Liquid fertilization lowered CH_4 emissions by 25% under AWD and 21% under SWP. Nitrous oxide (N_2O) emissions were higher in AWD due to aerobic conditions promoting nitrification, but SWP reduced N_2O emissions by 64–66% through consistent soil moisture and minimized emission peaks. Overall, global warming potential (GWP) decreased by 51% under AWD and 76% under SWP, with Broadcast-SWP achieving the lowest emissions due to significant reductions in N_2O.

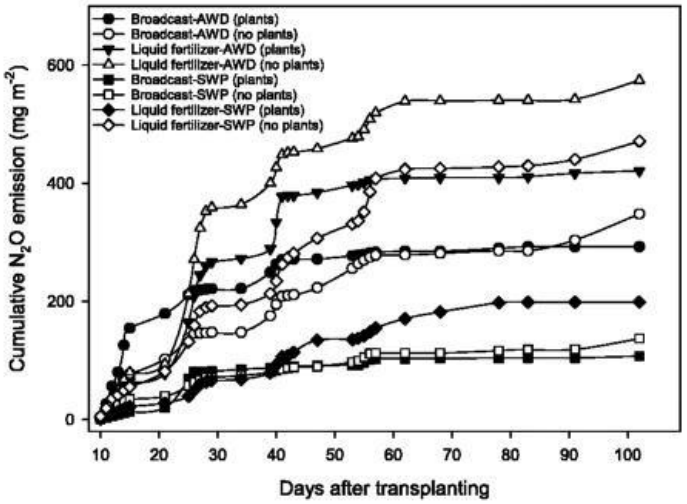
This research concludes that improved water management and precise nitrogen application can minimize water use and reduce N_2O and CH_4 emissions with minimal impact on yield. SWP irrigation is a water-efficient, climate-smart method that reduces emissions through controlled aerobic-anaerobic transitions. Despite its higher initial costs and complexity, it delivers low emissions and yields comparable to AWD, making it a more sustainable option from this study. AWD, meanwhile, is a low-tech, cost-effective, and easily adaptable technique suitable for smallholder farmers. Further long-term studies under diverse environmental conditions, such as groundwater measurements, are recommended to fully assess these approaches.

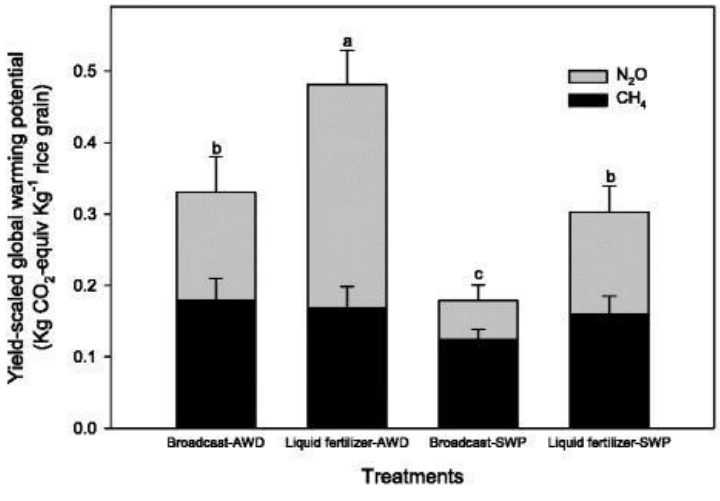
Graphical Abstract



Alternate wetting and drying (AWD) scheduling

Soil Water Potential (SWP) scheduling





Different letters indicate significance ($p < 0.05$) of treatments (small letters)

04 THEME: GHG emission reduction; MRV (Measurement, reporting, verification)

Greenhouse Gas Mitigation Potential of Alternate Wetting and Drying for Rice Production at National Scale—A Modeling Case Study for the Philippines

May 5, 2022 | JGR Biogeosciences | Source |

Introduction: Alternate Wetting and Drying (AWD), a technique that involves intermittently drying fields to maintain a shallow soil water table, has emerged as a promising irrigation method for reducing CH_4 emissions and water use while sustaining crop yields under optimal management. However, its impact on nitrogen oxide (N_2O) emissions remains uncertain. This study, conducted by researchers from the Karlsruhe Institute of Technology in Germany, uses the process-based biogeochemical model LandscapeDNDC to evaluate AWD's mitigation potential at a national scale in the Philippines over a 12-year period. By analyzing intra- and inter-annual GHG emissions under AWD and CF practices, including off-season patterns, the research aims to advance Tier 3 national GHG inventory methodologies and inform data-driven decisions for scaling AWD adoption as a climate-smart agricultural strategy.

Key findings: This study tested the LandscapeDNDC model using data from 93 cropping seasons in the Philippines to predict GHG emissions and crop growth under various management practices. It incorporated climate, soil, and land-use data to simulate six scenarios, including conventional flooding (CF), rainfed (RF), and Alternate Wetting and Drying (AWD). Model accuracy was evaluated using statistical measures, while simulations assessed GHG emission reductions and residue management impacts.

The results revealed that implementing AWD at a national level could reduce methane emissions from irrigated rice fields by approximately 23%, though N_2O emissions increased by 15%. Despite this, CH_4 remains the dominant contributor to the global warming potential (>95%) of rice production, both under CF and AWD management. The mitigation benefits of AWD were more pronounced in the dry season (38% reduction in CH_4) compared to the wet season (19%), highlighting the role of weather conditions. Key factors influencing emission reductions included irrigation intensity, residue management, and soil texture. Residue incorporation significantly affected emissions, amplifying CH_4 under all scenarios. Seasonal and spatial factors, including soil texture and water management, played critical roles in determining emission variability. Importantly, the study emphasized the need for consistent and site-specific management to maximize AWD's environmental benefits while mitigating risks, such as yield reductions due to improper water management.

These findings underline AWD's potential as a viable strategy under moderate fertilizer use for reducing GHG emissions in rice cultivation without compromising productivity. Future research should address the variability in N_2O emissions and the broader implications of integrating AWD into national GHG inventories. Further refinement of models to capture aerobic processes and irrigation variability is necessary for accurate GHG inventory development and policymaking.

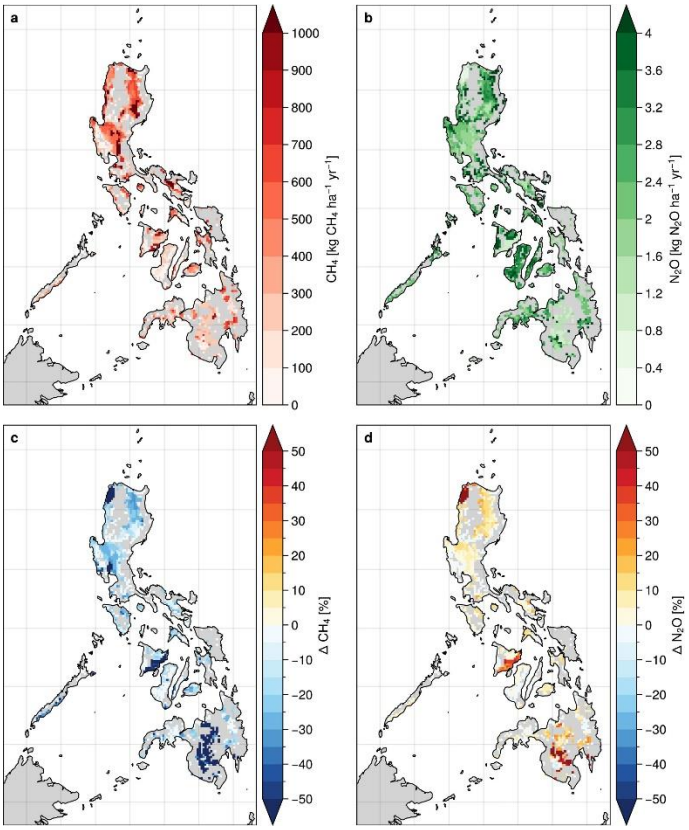


Figure | Panels (a and b) Simulated mean annual (12-year simulation period) emissions of CH_4 and N_2O for the aggregated CF* inventory corresponding to conventional field management. Panels (c and d) Relative change of CH_4 and N_2.

05 THEME: GHG emission reduction

Methane and nitrous oxide emissions in rice fields influenced with duration of cultivars and irrigation regimes

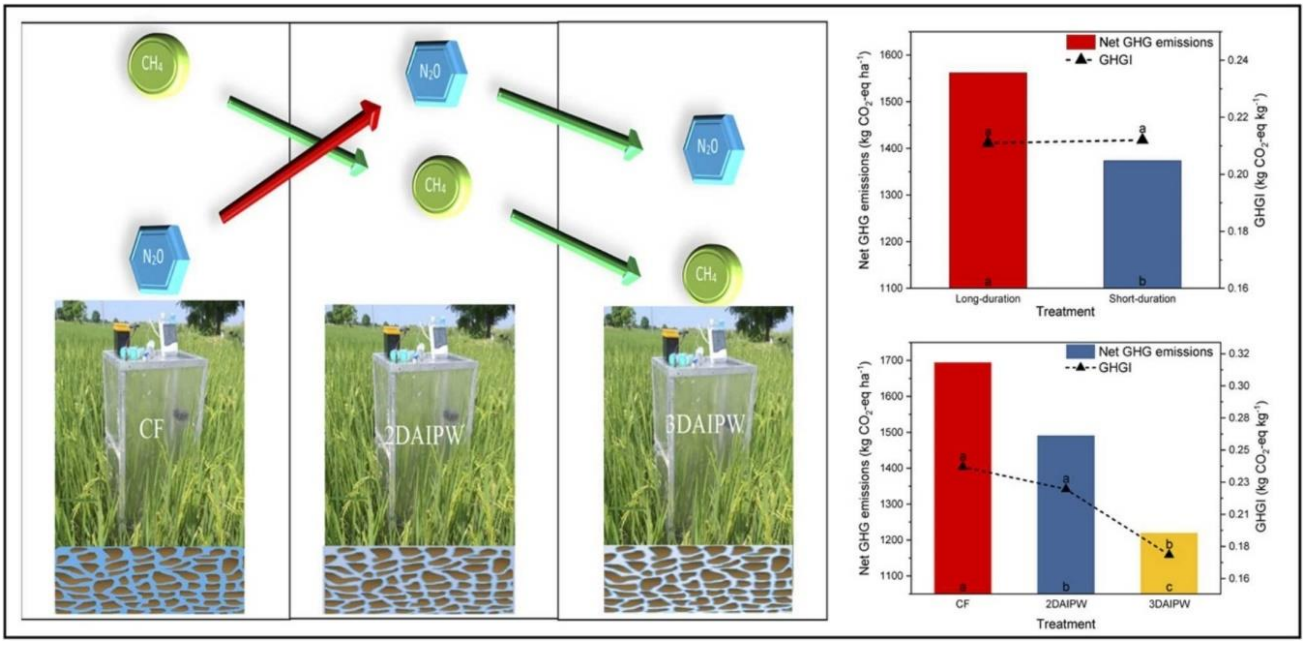
May 1, 2024 | Agriculture, Ecosystems & Environment | Source |

Introduction: Rice cultivation in Punjab, India, has increased by 56% over the last three decades, severely depleting groundwater reserves (97% of which is used for paddy) and contributing significantly to CH_4 emissions and carbon footprint. Improving water productivity through efficient irrigation management and addressing variability in GHG emissions across rice varieties is therefore essential. Despite the critical role of irrigation and cultivar choice, little research has assessed the trade-off between CH_4 and N_2O emissions or the global warming potential (GWP) of long- and short-duration rice cultivars under different irrigation regimes. To address this gap, soil scientists from Punjab Agricultural University conducted a two-year field experiment (2019-2020) to study the effects of rice cultivar duration (long vs. short) and irrigation methods (continuous flooding, CF; irrigation two days after infiltration, 2DAIPW; and three days after infiltration, 3DAIPW) on water productivity, yield, net GHG emissions, and greenhouse gas intensity (GHGI).

Key findings: Crop management, in particular irrigation scheduling and rice variety selection, has a significant impact on crop productivity and GHG emissions. Irrigation affects CH_4 emissions through soil-atmosphere gas exchange, while rice plants affect CH_4 dynamics by providing root exudates for methanogens, enabling CH_4 exchange via aerenchyma, and promoting CH_4 oxidation through oxygen transport. Emissions also vary between cultivars based on characteristics such as growth duration, tillering density and biomass.

This study found that short-duration rice cultivars reduced water use by 17% and CH_4 and N_2O emissions by 12% and 11%, respectively, compared to long-duration cultivars, despite yielding 12% less grain. Among the irrigation regimes, applying water three days after infiltration (3DAIPW) reduced irrigation water use by 31% and CH_4 emissions by 39% compared to CF, although it increased N_2O emissions by 29%. In addition, 3DAIPW improved water productivity and reduced GHGI by 26% without significantly affecting yield. The results suggest that combining short-duration varieties with irrigation three days after infiltration can improve resource efficiency and mitigate climate impacts in rice systems. However, the study highlights the need to optimize transplanting schedules for short-duration varieties to maximize their yield potential.

Graphical Abstract



06 THEME: Carbon sequestration; GHG emission reduction

Soil carbon sequestration increment and carbon-negative emissions in alternate wetting and drying paddy ecosystems through biochar incorporation

July 1, 2024 | Agricultural Water Management | Source |

Introduction: Alternate wetting and drying (AWD) is a widely adopted water-saving irrigation technique in Asian rice-producing countries that is effective in reducing CH_4 emissions while maintaining crop yields. However, long-term AWD can increase N_2O emissions, nitrogen and soil organic carbon (SOC) losses, and affect soil carbon sequestration and GHG emissions. Biochar, recognized as a negative emission technology and an effective use of straw resources, has the potential to increase soil carbon storage, improve grain yields, and suppress GHG emissions over time. However, biochar's aging effects on soil properties, GHG emissions, and crop yields remain understudied. How biochar converts rice fields to carbon negative and investigating net global warming potential (GWP) based on soil carbon sequestration is still limited, especially under AWD systems. To address this gap, researchers from Shenyang Agricultural University, China, conducted a three-year field study using a split-plot design to evaluate the effects of biochar on CH_4 and N_2O emissions, soil carbon sequestration, net GWP, and rice yield under AWD and continuous flooding (CF) irrigation.

Key findings: A three-year field experiment in Shenyang, China, used a split-plot design with CF and AWD irrigation, with biochar applied at 0 and 20 t/ha. CH_4 and N_2O emissions were measured using an opaque static chamber method and gas chromatography. SOC, nitrogen, soil pH, redox potential and rice yield were analyzed using potassium dichromate digestion, KCl extraction and automated analyzers.

This study demonstrated that integrating biochar with AWD significantly improved soil carbon sequestration and reduced GHG emissions. AWD irrigation significantly reduced CH_4 emissions by 63-79% over three years compared to CF. However, AWD increased N_2O emissions by 100-123%. The addition of biochar (20 t/ha) reduced CH_4 emissions by 22% in the second year and 38% in the third year, while mitigating AWD-induced N_2O emissions by 28-33%. Biochar also improved soil carbon sequestration , particularly under AWD, resulting in the highest soil carbon sequestration (56.9 t C/ha) and lowest net GWP of -23.0 t CO_2-eq/ha. Grain yield was unaffected in the first year but increased by 5-11% in subsequent years with biochar application. The effects of biochar on soil properties (e.g. pH and redox potential) improved conditions for CH_4 oxidation and suppressed N_2O emissions over time. Therefore, despite increased N_2O emissions under AWD, biochar effectively reduced GWP and GHGI by an average of 74%. Overall, compared to CF without biochar, biochar application in CF and AWD reduced net GWP by four and eight times, respectively, due to increased soil carbon. AWD with biochar achieved further reductions in GWP compared to CF with biochar. The results suggest that combining biochar with AWD offers a sustainable strategy for mitigating GHG emissions, enhancing carbon sequestration and achieving carbon-negative rice production. This approach supports climate-smart agricultural practices, especially in water-scarce regions; while further research is recommended to explore long-term impacts and wider applications.

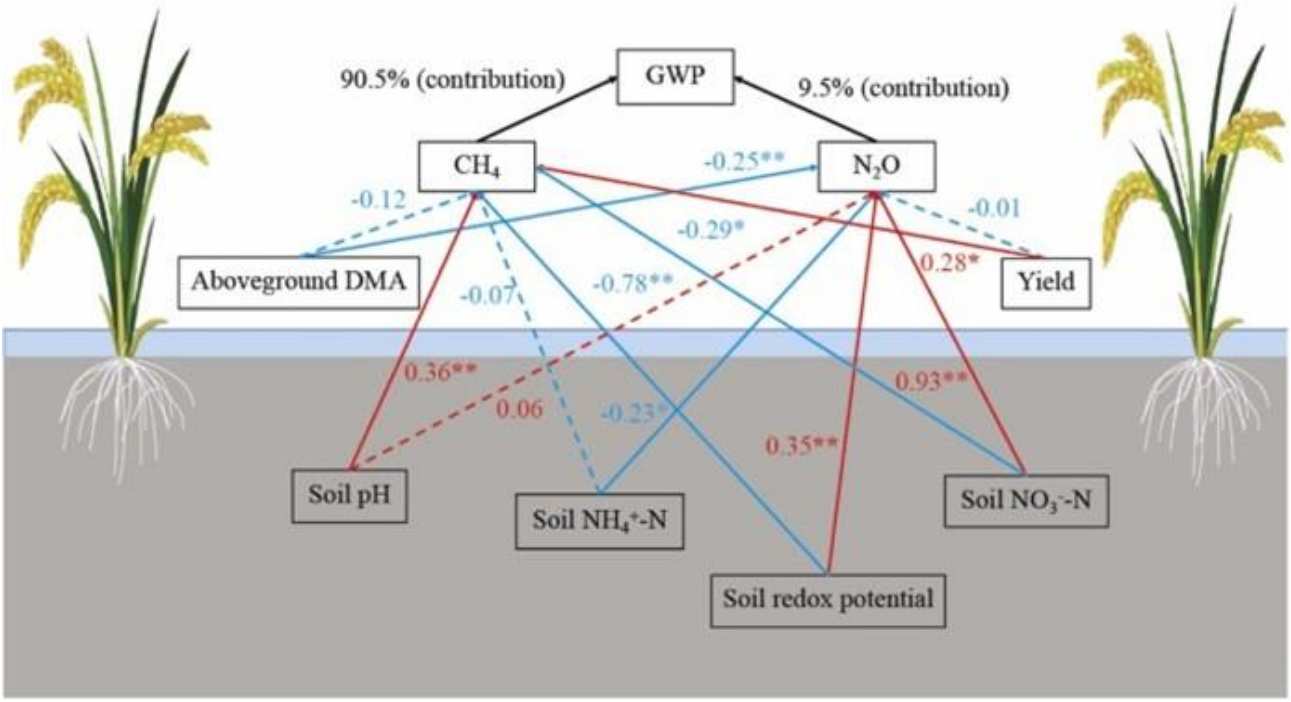


Figure | Path analysis of CH_4 and N_2O emissions and soil environmental factors. Red arrows indicate positive impacts, blue arrows represent negative impacts, solid lines effect significantly and dotted lines effect insignificantly. Black arrows indicate contribution value of CH_4 and N_2O emissions to GWP. **: $P < 0.01$; *: $P < 0.05$; ns: no significant. Values indicate the strength of the relationship between the two variables.

07 THEME: GHG emission reduction; Carbon sequestration

Optimizing the rate of straw returning to balance trade-offs between carbon emission budget and rice yield in China

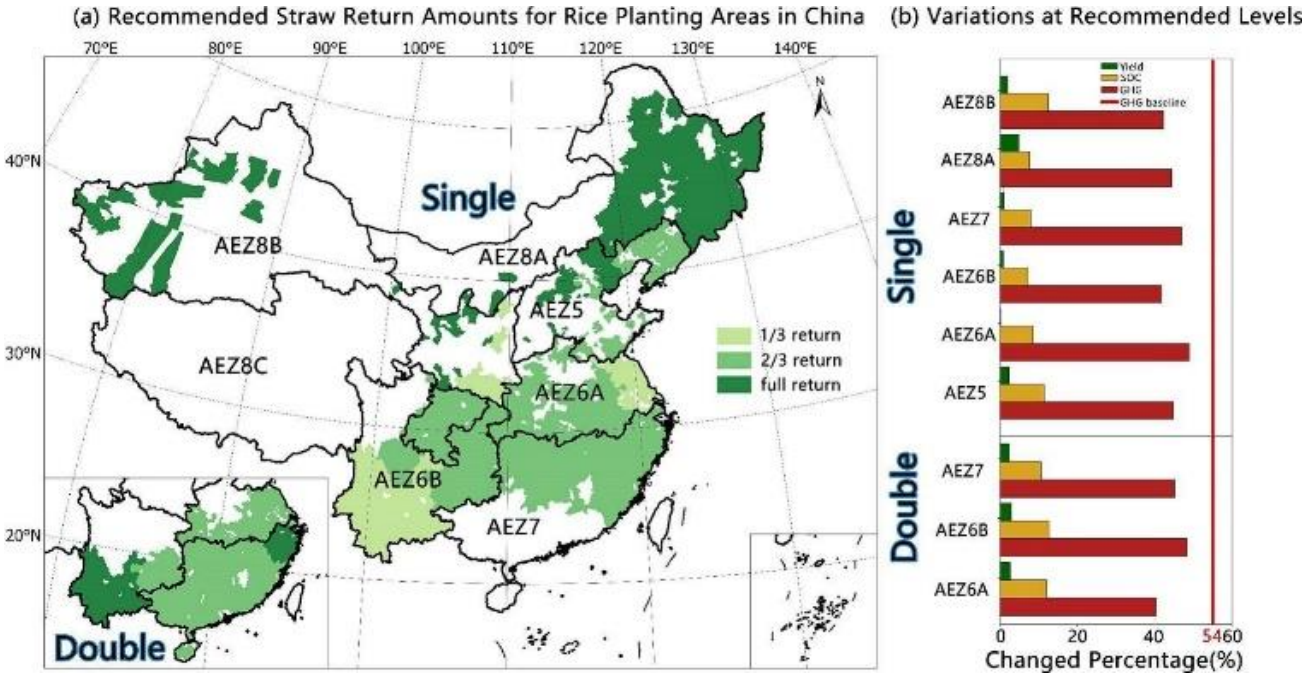
June, 2024 | Sustainable Production and Consumption | Source |

Introduction: As the world's largest producer (15.4%) and consumer (21.4%) of rice, China faces the critical challenge of balancing rice yield and soil health while increasing soil organic carbon (SOC) and reducing greenhouse gas (GHG) emissions. Straw returning is a promising practice for increasing SOC accumulation in rice cropping systems but has been associated with a 60% increase in CH_4 emissions in China. Despite its potential, national-scale studies on optimal straw return rates to maximize yields, increase SOC, and mitigate GHG emissions are limited. This study, led by researchers from the Chinese Ministry of Agriculture and Rural Affairs, used the Dynamic Nitrogen and Carbon Model (DNDC) with county-level meteorological, soil, and field management data to simulate the effects of different straw returning rates on yield, SOC, and GHG emissions in China from 2010 to 2022, with the aim of identifying region-specific strategies that balance agricultural productivity with environmental sustainability.

Key findings: This study analyzed rice production in 1,852 counties in China, covering single and double cropping systems in four agro-ecological zones. Using high-precision meteorological (ERA5) and soil data, together with regional farming practices, the researchers simulated yields, soil carbon changes and greenhouse gas emissions. Straw return practices were evaluated for their impact on rice yield, SOC content and GHG emissions using the DNDC model for different incorporation rates (1/3, 2/3 and full straw).

The results showed that straw returning significantly improved rice yields, with yield increases of up to 3.26% for single-crop rice and up to 5.95% for late double-crop rice under full incorporation, while SOC levels improved nationally by 3.88%, 7.75% and 11.65% for the respective rates, with diminishing returns in areas with high initial SOC. Northeast China had the highest yield and SOC gains due to favorable cooler temperatures and soil conditions. However, these benefits came with trade-offs as GHG emissions, particularly methane, increased by 23.32%, 43.50% and 61.48% for the respective incorporation rates, with warmer regions such as the Sichuan Basin experiencing the most pronounced emissions due to higher soil pH and temperatures. Regional analysis suggests that full incorporation is most appropriate for northern regions where yield and SOC benefits outweigh GHG increases, while two-thirds incorporation is optimal for southern regions to balance productivity and emissions. In areas such as Yunnan and Jiangsu, where excessive straw has had a negative impact on yield, one-third incorporation is recommended. The study highlights the importance of region-specific strategies, such as off-season straw application or composting, to enhance carbon sequestration and reduce emissions, thereby supporting climate-smart agriculture in China.

Graphical Abstract



NEWS

01 **THEME:** GHG emission reduction; Others

Odisha: ICAR-NRRI scientists develop novel formulation for reducing methane emissions from paddy fields

August 15, 2024 | Sambad English |

Scientists at the ICAR-National Rice Research Institute (NRRI) in Odisha, India, have developed an innovative solution to mitigate methane emissions from paddy fields. By isolating a methane-oxidizing bacterial strain (methanotroph MT-22) from the Sundarbans mangroves and developing a specialized formulation through extensive laboratory and field trials, the research team successfully achieved a 10–12% reduction in methane emissions when applied to rice fields.

Irrigated paddy fields currently contribute approximately 3.97 Tg of methane emissions annually in India. The new bacterial application can reduce emissions from 0.55 kg to 0.49 kg of methane per hectare per day—equivalent to the greenhouse gas emissions of a diesel vehicle traveling 10 km daily. As the technology approaches commercial readiness, it offers promising economic opportunities for farmers through potential carbon credits while simultaneously addressing environmental concerns. With India cultivating rice across 44.6 million hectares, such innovative approaches are crucial for developing climate-smart agricultural practices.

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02 **THEME:** GHG emission reduction; MRV (Measurement, reporting, verification); Policy incentives, financing, pricing; Others

Bayer, GenZero, Shell, and Mitsubishi collaborate to empower rice farmers in India through TGRA

October 21, 2024 | Agro Spectrum India |

THE GOOD RICE ALLIANCE

Reducing emissions, enriching the planet

Supported by

BAYER GenZero Mitsubishi Corporation

The Good Rice Alliance (TGRA), a collaborative effort by Bayer, GenZero, Shell, and Mitsubishi, is transforming rice cultivation in India through climate-smart practices like Alternate Wetting and Drying (AWD) and Direct Seeded Rice (DSR). Operating across nine states, the alliance has engaged over 10,000 farmers spanning 25,000 hectares, with a projected annual reduction of 100,000 tons of CO_2e methane emissions.

TGRA plans to expand its reach by 8,500 hectares while refining greenhouse gas measurement and farmer support systems. Utilizing Total Quality Management (TQM) tools and a rigorous Monitoring, Reporting, and Verification (MRV) mechanism, the initiative ensures credible emission reductions.

Farmers could benefit from lower cultivation costs and potential carbon credits, simultaneously supporting environmental sustainability. The program aligns with India's rapidly growing carbon offset market, expected to reach $68.5 million by 2033, representing a 28% annual growth.

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03 **THEME:** GHG emission reduction; ICT in agrifood sustainability; Others

Building Partnerships for Innovative Rice Straw Management: Key to a Greener Future

November 02, 2024 | International Rice Research Institute (IRRI) |

Experts from governments, NGOs, academia, and industry gathered at a two-day workshop co-organized by IRRI and ADB to address sustainable rice straw management in ASEAN countries. The workshop, part of the MAFF Japan-IRRI project, focused on carbon neutrality and circular agriculture.

Participants explored solutions to the prevalent issue of rice straw burning, which causes significant pollution and GHG emissions as well as nutrient and biodiversity loss. Challenges discussed included limited market value, handling difficulties, and farmer awareness. Sustainable alternatives like composting, livestock feed, biochar, and bio-pellets were highlighted for their economic and environmental potential.

The Kluang Pilot Plant in Malaysia demonstrated bio-pellet production as a promising renewable energy source. Proposed research areas included remote sensing for monitoring straw burning, microbiome applications for decomposition, and standardized cost-benefit analyses. Policy interventions emphasized raising awareness, capacity building, and equipment subsidies, along with recommendations on knowledge sharing and partnerships across agricultural and energy sectors.

04 **THEME:** Policy incentives, financing, pricing; Carbon sequestration; Others

Sorjan Farming: A Climate-Smart Solution for Coastal Bangladesh

November 5, 2024 | Rice Today (IRRI) |

Coastal farmers in Bangladesh are battling rising sea levels, salinity and erratic rainfall, threatening food security and livelihoods. Traditional farming methods are struggling under these conditions, but sorjan farming is emerging as a sustainable solution to these challenges.

Sorjan farming involves creating alternating raised beds and deep sinks on arable land. Crops are grown on the raised beds, while the sinks store water and support fish farming. This system protects crops from flood damage, manages salinity and ensures irrigation during the dry season, enabling year-round food production. Key benefits include:

- **Year-Round Food Production**: Crops and fish can be grown even during waterlogged monsoons, ensuring food security.
- **Increased Income**: Farmers can harvest a variety of vegetables, fruits, and fish continuously, boosting earnings.
- **Climate Resilience**: Raised beds prevent crop loss during floods, while furrows manage water during dry periods.
- **Environmental Sustainability**: Improved biodiversity enhances soil health, pest resistance, and carbon sequestration.
- **Flexibility**: Farmers can adjust planting schedules based on market and climate conditions.

Yet high setup costs, labor demands, and limited awareness hinder widespread adoption. However, support from government agencies, NGOs, and community initiatives is expanding its reach. Organizations such as the Department of Agricultural Extension (DAE), Bangladesh Agricultural Research Institute (BARI), and local NGO BRAC are promoting sorjan farming through training and financial assistance. Still, more research is needed to optimize its implementation and scalability.

05 **THEME:** MRV (measurement, reporting, verification)

From Theory to Action – Agriculture's Call to Implement MRV for Accurate Climate Reporting

October 28, 2024 | International Rice Research Institute (IRRI) |

Agriculture accounts for 31% of global greenhouse gas (GHG) emissions, with rice production alone contributing 8-14% of the sector's total emissions. Accurate monitoring, reporting and verification (MRV) of these emissions is critical to achieving climate goals, as highlighted at the "Climate

Transparency in Agrifood System: Understanding MRVs and COP29" workshop, co-organized by the International Rice Research Institute (IRRI) from 21-23 October. The workshop brought together experts from Asia-Pacific countries to discuss the challenges of measuring GHG data and develop policy recommendations for the region ahead of COP29. Current MRV systems operate according to three tiers defined by the IPCC, ranging from Tier 1's global default factors to Tier 3's advanced ground measurements and modelling that provide the highest accuracy. However, adoption of Tier 3 is limited due to cost, technical capacity and data management challenges. One of the few countries that has demonstrated the ability to use a Tier 3 inventory in rice production is Japan.

Experts stressed that moving from Tier 1 to Tier 2 - using locally measured emissions data - could improve accuracy without adding undue complexity. Vietnam's tried and tested approach to MRV systems, combining ground and satellite data, was presented as a model for comprehensive GHG assessment. However, the costs of training, equipment and national implementation remain significant barriers.

Despite these challenges, robust MRV systems are essential for effective participation in carbon markets and for achieving Nationally Determined Contributions (NDCs) under the Paris Agreement. Stakeholders stressed the urgency of addressing methodological and financial barriers to support climate-smart agriculture, reduce emissions, and protect global food security as climate impacts intensify.

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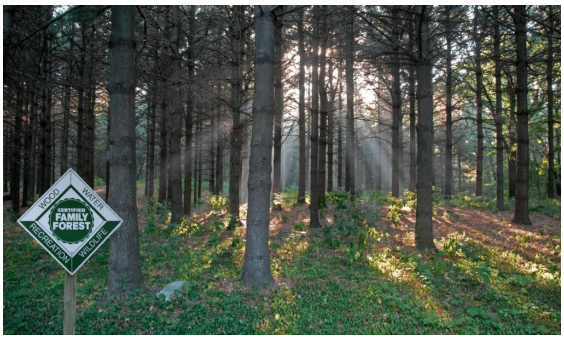
06 **THEME:** Carbon sequestration; Policy incentives, financing, pricing, Others

America's First Nature-Based Carbon Credit Auction Could Reshape the VCM in 2025

October 17, 2024 | Carbon Credits |

In February 2025, the American Forest Foundation (AFF) will launch a groundbreaking carbon credit auction through its Family Forest Carbon Program (FFCP). Designed to support rural communities and small forest owners, the auction offers businesses an efficient way to purchase high-quality nature-based carbon credits while addressing critical funding gaps in climate mitigation projects.



Traditional payment upon delivery models delay project implementation, but the AFF auction structure could accelerate action. The AFF Carbon Auction introduces a hybrid financing model that provides partial upfront payments to project developers. This ensures early project initiation and ties corporate investment to measurable milestones such as enrolment and verification progress. Buyers secure carbon credits at competitive prices, protecting them from future market volatility while supporting long-term decarbonization goals.

Nature-based solutions (NbS), such as sustainable forest management, have immense potential to mitigate climate change, but remain underfunded, with only 1.2% of their annual potential tapped by the voluntary carbon market (VCM). According to the International Union for Conservation of Nature (IUCN), NbS could deliver 30% of global climate mitigation by 2030 and generate cost savings of US$393 billion by 2050.

Removal credits will dominate the auction, providing both environmental and financial benefits. In addition, the FFCP empowers small forest owners with technical assistance and financial incentives to enhance carbon storage while delivering co-benefits such as improved water quality, biodiversity and forest resilience. By encouraging early investment and providing transparency, the AFF auction aims to transform VCM in the US by filling funding gaps and encouraging corporate participation.

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07 **THEME:** Policy incentives, financing, pricing; GHG emission reduction; Carbon sequestration; Others

USDA Invests $1.5 Billion in 92 Partnership Projects to Advance Conservation and Climate-Smart Agriculture

October 23, 2024 | U.S. Department of Agriculture (USDA) |

The U.S. Department of Agriculture (USDA) has announced a historic $1.5 billion investment in 92 conservation projects through the Regional Conservation Partnership Program (RCPP). This initiative, bolstered by the Inflation Reduction Act (IRA), combines federal funding with $968 million in partner contributions to help farmers, ranchers and forest landowners adopt climate-smart and conservation practices. RCPP projects address key conservation priorities, including climate mitigation, water conservation, wildlife habitat restoration, and tribal-led conservation. For example, Blue Ridge Resource Conservation and Development is working to improve water quality and wildlife habitat in North Carolina, while the US Endowment for Forestry and Communities is protecting habitat to prevent endangered plant and animal species from becoming extinct. Since its inception, RCPP has mobilized more than $8 billion in funding and 4,000 partner organizations. By fostering public-private collaboration, these projects support sustainable agriculture, protect natural resources, and help mitigate climate change.

08 **THEME:** Policy incentives, financing, pricing; GHG emission reduction; Others

Paving the Way for Agriculture Emission Reductions – the Danish case

November 7, 2024 | ARC2020 |

Denmark has become the first country to introduce a carbon tax on agriculture, signaling a transformative approach to reducing emissions in the sector. The "Green Tripartite Agreement", forged through collaboration between government, agricultural and environmental organizations, labor unions, and industry leaders, sets ambitious goals for cutting emissions and rethinking land use. Key components include:

1. Carbon taxation: Taxes on emissions from livestock, liming and peatlands will be phased in from 2028, with rates designed to encourage the adoption of climate-friendly practices while taking into account technological limitations.
2. Green Land Fund: A €5.4 billion fund will support initiatives like afforestation, peatland restoration, and nitrogen reduction. By 2045, 250,000 hectares of forests and 140,000 hectares of rewet peatlands are targeted for transformation.
3. Nitrogen regulation: Enhanced policies aim to reduce nitrogen leaching into water bodies, incentivizing land-use shifts from intensive farming to afforestation or low-impact practices.

The tax is projected to reduce agricultural production by 4% by 2030, with 1,500 job losses and a 2% increase in meat prices. However, the robust financial position and adaptability of the Danish agricultural sector mitigates these effects. Nevertheless, critics argue that the agreement focuses too much on technological fixes rather than structural changes such as the promotion of plant-based diets and biodiversity efforts. Weak synergies with the EU's Common Agricultural Policy (CAP) also limit its impact, as CAP funds remain underutilized for climate goals. Despite the gaps, the Green Tripartite Agreement is a crucial step towards making agriculture more sustainable. Its ambitious policies could serve as a model for other nations, provided that financial and political conditions are in place to support long-term implementation.

09 **THEME:** Policy incentives, financing, pricing; GHG emission reduction; Carbon sequestrstion

Taiwan's Agricultural Carbon Neutrality Efforts to Achieve Net-Zero Emissions by 2040

October 23, 2024 | Moneyweekly | (in Chinese)

The "Toward 2040 Net-Zero in Agriculture: Natural Carbon Sequestration and ESG Strategy Forum", co-hosted by the International Climate Development Institute (ICDI), Taiwan's Ministry of the Environment and other agencies, highlighted Taiwan's progress in natural carbon sequestration and sustainable agriculture.

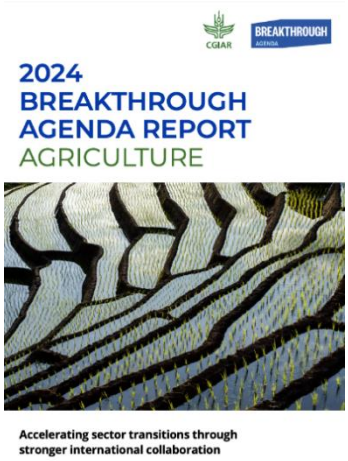
By harnessing natural carbon sequestration through soil, forest and marine systems, agriculture is one of the keys to Taiwan's net-zero strategy. The Forum highlighted efforts such as reusing agricultural waste and promoting carbon sequestration. These initiatives aim to strengthen the reliability of carbon markets and encourage collaboration between agriculture and business on ESG projects, with a focus on biodiversity and sustainable investment. While challenges such as high costs and limited global market participation remain, innovative land management and improved soil carbon storage are showing progress. The Forum also highlighted the fight against "carbon fraud" to ensure transparency in carbon markets. By sharing practical strategies and innovative business models, the Forum provided insights on how to improve Taiwan's natural carbon sequestration efforts through tailored methodologies and collaborative approaches.

POLICY

01 THEME: Climate smart agriculture; Net zero strategy

2024 Breakthrough Agenda Report: Agriculture

CGIAR | Source | Download |



Since the Breakthrough Agenda's launch at COP26 in 2021, international cooperation in agriculture has accelerated, highlighting food systems' vital role in climate mitigation, adaptation, food security, and environmental sustainability. The goal is to make climate-resilient, sustainable agriculture the most attractive and widely adopted choice for farmers worldwide by 2030. The 2024 Breakthrough Agenda Report stresses the urgent need for global collaboration to transform agriculture into a low-emissions, climate-resilient sector, ensuring food security, especially for vulnerable populations in ow- and middle-income countries (LMICs).

Agriculture is responsible for nearly one-third of global greenhouse gas emissions, with Livestock methane and fertilizer use are among the sector's most significant contributors to GHGs, making immediate and substantial reductions in these areas is crucial. The report emphasizes the potential of four key technologies to reduce emissions in agriculture: **methane inhibitors** and **low-methane forages** for livestock, and **green ammonia** and **site-specific nutrient management (SSNM)** for fertilizers production and application. Methane inhibitors like 3-NOP can cut enteric methane emissions by up to 30%, while low-methane forages adjust feed to naturally reduce emissions. Green ammonia, produced using renewable energy, offers a sustainable alternative to fossil fuel-dependent fertilizer production, and SSNM minimizes nitrous oxide emissions by tailoring fertilizer application to crop needs. However, adoption faces challenges, including high costs, regulatory inconsistencies, limited technical support, and low market demand for low-emission products, particularly in LMICs. To drive progress, the report outlines five sets of priority actions, namely, finance; knowledge sharing; metrics and standards; support for RD&D; and trade and markets.

Recommendation for Priority Action

- Increase climate finance to fund and scale sustainable agricultural technologies by integrateing green finance frameworks, redirecting subsidies, and aligning global agendas.
- Promote global knowledge sharing on policies and practices through pledges, frameworks, and dialogues.
- Develop metrics based on robust global frameworks to track the adoption of sustainable solutions.
- Increase investment in research, development, and demonstration (RD&D) to scale innovative agricultural technologies, especially in LMICs.
- Enable the private sector to expand solutions through global markets to facilitate global trade in low-emission agricultural products.

02 THEME: Sustainable production; Supply chain

Japan's Food, Agriculture, and Rural Areas Basic Law (食料・農業・農村基本法)

Ministry of Agriculture, Forestry and Fisheries (MAFF), Japan | Source | Download | (in Japanese)

Japan's Food, Agriculture and Rural Areas Basic Law, which explains the basic principles and measures of Japan's agricultural policy, was enacted in 1999, and many changes have occurred in Japan's agriculture over the past 25 years. In view of recent changes in the international situation, posing risks to food security, climate change impacts and global environmental issues, MAFF has been reviewing and amending the Basic Law since 2022 to respond to current and future realities and as a means for advancing agricultural policy, and submitted an amendment to the Basic Law in the same year. The current amendment, passed in June, reviewed and formulated the basic principles and measures that aim to strengthen food security, establish a food system in harmony with the environment, and improve productivity for the sustainable development of agriculture and rural communities. These include:

Ensure Food Security:

- Basic Principle: Food security ensures a stable supply of quality food at reasonable prices for all citizens.
- Key Measures: Improve food access, diversify import sources, promote agricultural exports, and enhance cost transparency within the food system.

Establish Environmentally Responsible Food Systems:

- Basic Principle: Food systems must reduce environmental burdens at all supply chain stages.
- Key Measures: Reduce environmental impacts of food industry operations.

Sustainable Agricultural Development:

- Basic Principle: Enhance productivity and value-added to achieve sustainable agriculture.
- Key Measures: Strengthen farm management, optimize land use, adopt smart technologies, support agribusinesses, and mitigate price volatility for agricultural inputs.

Rural Revitalization:

- Basic Principle: Rural areas must thrive to sustain local communities.
- Key Measures: Support farmland conservation, encourage rural business activities, promote agritourism, integrate agriculture with social services, and implement wildlife damage prevention measures.



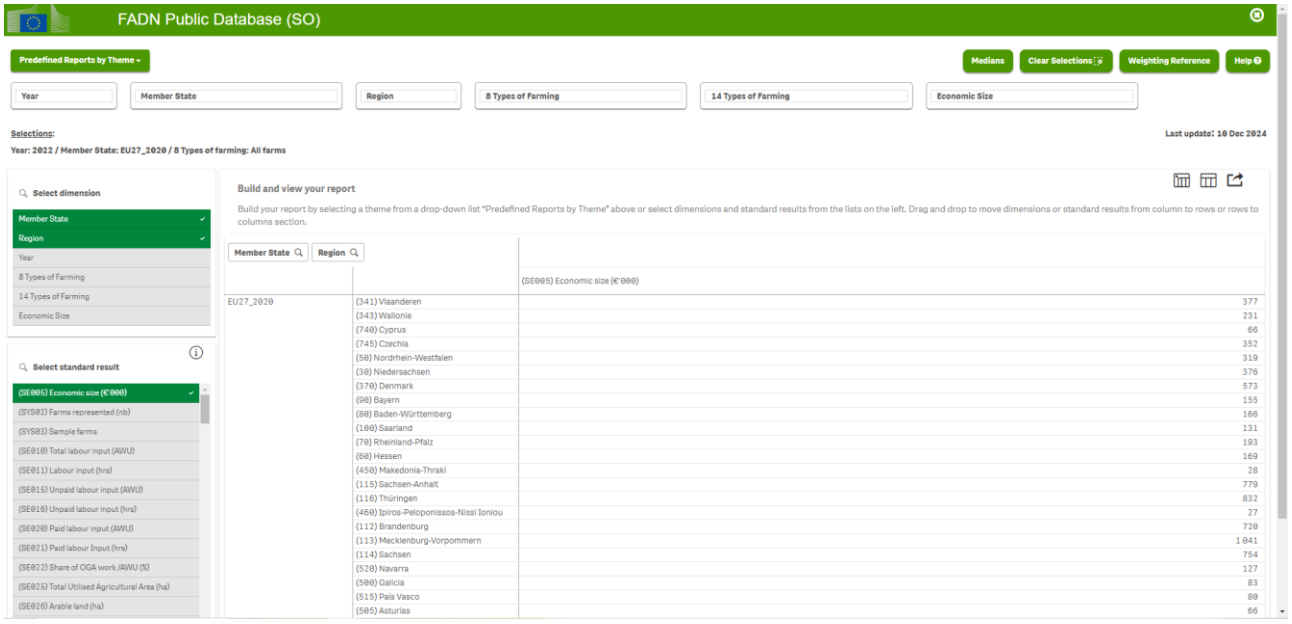

03 THEME: Sustainable production

EU - Farm Sustainability Data Network (FSDN)

European Commission | Source | Outline |

The new Farm Sustainability Data Network (FSDN), adopted by the European Commission in October 2024, is an yearly farm survey that builds on the long-standing Farm Accountancy Data Network (FADN). For decades, FADN has collected annual economic data from 80,000 farms, representing 3.7 million farms and 90% of EU agricultural production. Managed at national level and aggregated at EU level, it provides critical insights into the economics of farms. Starting in 2025, the FSDN will expand data collection at farm level to include economic, environmental and social sustainability dimensions. The regulation introduces a phased implementation to ensure a smooth transition to the new data framework, allowing Member States to adapt gradually.

Currently, the FADN collects structural data (e.g. crop area, number of animals, assets) and accountancy data (e.g. value of farm output, input costs such as fertilizers and pesticides). With the transition to FSDN, additional data will include quantities of fertilizers, pesticides, feed, and antimicrobials, as well as farm management information such as environmental practices, manure, water, energy use, and market integration. This expanded dataset will provide a more comprehensive view of agriculture, integrating information from the FSDN, CAP strategic plans and the IACS (Integrated Administration and Control System). This holistic approach will improve the understanding of agricultural practices, environmental impacts and economic performance, supporting sustainability analysis and better informed decision-making at national and EU level.



04 THEME: Climate smart agriculture; Nature-based solutions

US - Regional Conservation Partnership Program (RCPP)

U.S. Department of Agriculture (USDA) | Source | Download |

The Regional Conservation Partnership Program (RCPP) is a partner-driven initiative that addresses natural resource challenges on agricultural lands. By leveraging collective resources and fostering public-private partnerships, RCPP expands the impact of voluntary conservation efforts and promotes climate-smart agriculture and demonstrates the effectiveness of collaboration in achieving agricultural and environmental goals.

RCPP applications must present effective solutions addressing one or more natural resource priorities. Projects can include a variety of on-the-ground activities by farmers, ranchers, and forest landowners, such as land management/land improvement/restoration practices; land rentals; entity- or US-held easements; public works/watersheds. Applications may combine any of these eligible activities within a single RCPP project.

Partners must also provide cash or in-kind contributions to leverage NRCS's (Natural Resources Conservation Service) RCPP investments, ideally matching NRCS funding. Substantial contributions receive priority during application evaluation. Partners must demonstrate expertise, capacity to manage projects, producer outreach, and environmental outcome measurement. Preference is given to applicants engaging historically underserved farmers and ranchers. Since its inception, RCPP has made 812 awards involving more than 4,000 partner organizations, leveraging more than $4 billion in NRCS funding with an additional $4 billion in partner contributions.

05 THEME: Carbon smart agriculture

Brazil's ABC+ Plan for Adaptation and Low Carbon Emission in Agriculture

Ministry of Agriculture, Livestock and Food Supply (MAPA), Brazi | Source | Download |

The ABC+ Plan, building on the successes of the first cycle (2010-2020), the new phase promotes science-based practices, technological innovation, and GHG mitigation through the Integrated Landscape Approach. Strengthened governance, robust monitoring, and Measurement, Reporting, and Verification (MRV) systems ensure transparency, continuous improvement, and the adoption of sustainable solutions. Economic incentives and market instruments will further support sustainable production, enhancing Brazil's domestic and global image. By prioritizing regional actions and expanding the use of sustainable technologies, the ABC+ is a key national plan that addresses climate adaptation, food security, and sustainable development, positioning Brazil as a leader in resilient and low-carbon agriculture by 2030. The ABC+ Plan is supported by the following conceptual basis and integrated strategies.

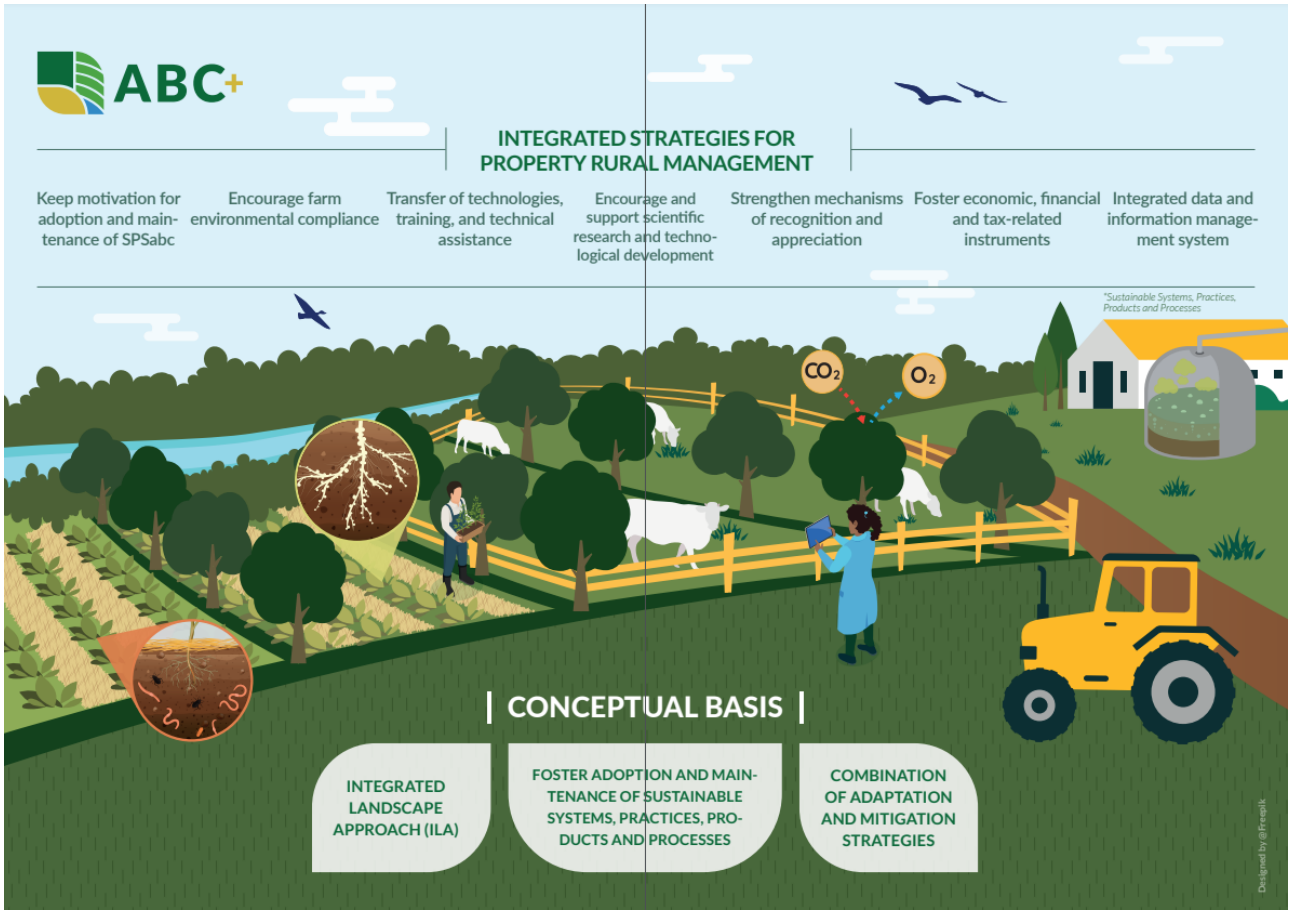
Conceptual Basis:

- **Integrated Landscape Approach (ILA)** promotes sustainable land management by balancing agricultural productivity, conserving natural resources, valuing ecosystem services, and resolving land use conflicts while recognizing regional cultures and ensuring efficient, compliant land use.
- **Synergy of adaptation and mitigation strategies**, including conservation practices, integrated systems, biodiversity recovery, and risk management tools, are essential to reduce farming systems' vulnerability, enhance resilience, and ensure sustainable, efficient, and profitable agricultural production amidst climate change threats.
- **Foster adoption and maintenance of Sustainable Systems, Practices, Products and Production Processes (SPS_{ABC})** through conservation farming practices to enhance agricultural efficiency, resilience, and sustainability by preserving natural resources through minimal soil disturbance, maintaining crop residues, and diversifying species, ensuring profitability while protecting ecosystems.

Strategies

- Sustain motivation for adoption and maintenance of SPS_{ABC}, fostering increased productivity and income, resilience and control of GHG emissions
- Technology transfer, training, and technical assistance
- Encourage and support scientific research and technological development and improvement of SPS_{ABC}
- Strengthen mechanisms for recognition and appreciation of adoption of SPS_{ABC}

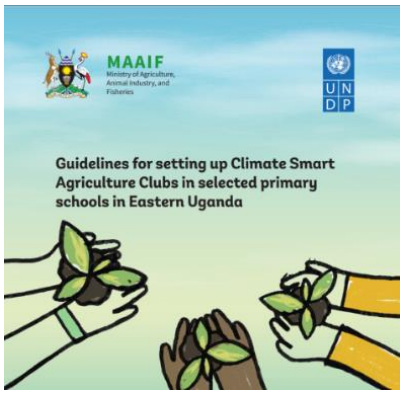
- Promote economic, financial and fiscal instruments to support SPS_{ABC}
- Integrated data and information management system for effective Measurement, Reporting and Verification (MRV) Mechanisms
- Encourage farm environmental compliance and sustainable production through the Integrated Landscape Approach



06 THEME: Climate smart agriculture

Guidelines for setting up Climate Smart Agriculture Clubs in Primary Schools

Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), Uganda & United Nations Development Programme (UNDP) | Source | Download |



The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), with support from UNDP, EU, and COMESA (Common Market for Eastern and Southern Africa), is implementing a project in Eastern Uganda to enhance climate-resilient agriculture, promote Climate Smart Agriculture (CSA) adoption, and attract private sector investment in climate-smart inputs, technologies, and services.

As part of the project, MAAIF has launched CSA Clubs in selected Eastern Uganda primary schools to promote CSA practices and technologies. These clubs educate pupils and teachers on CSA concepts, fostering champions who apply and promote CSA in school and home gardens, as well as within their communities. This guide provides procedures and processes to assist teachers and pupils from those schools in setting up CSA Clubs as a forum for understanding and applying CSA practices and technologies in school and home gardens.

Teachers facilitate CSA Clubs by guiding student-led activities, resolving disputes, and monitoring progress, while pupils create and implement plans promoting CSA. Clubs support school feeding programs, generate income, and raise CSA awareness in schools and communities. Active participation is required, with schools providing space, support, and recognition.

OPEN DATA

01 THEME: Climate smart and Net-zero toolkit;GHG emission inventory; Climate action plans and programs

Greenhouse Gas Mitigation in Rice

International Rice Research Institute (IRRI) | Source |

Greenhouse Gas Mitigation in Rice, developed by IRRI and global partners, is a knowledge platform designed to reduce greenhouse gas (GHG) emissions in rice cultivation. It facilitates the development of national strategies and Monitoring, Reporting, and Verification (MRV) systems and was initially created to support Vietnam in achieving its Nationally Determined Contribution (NDC) targets for agriculture. The platform addresses challenges related to emission data and policy support while demonstrating how mitigation efforts can align with and enhance agricultural productivity.

The platform provides a suite of tested tools for GHG mitigation and MRV, including RICEMORE, FARMORE, SECTOR, COMPARE, MapAWD, DISPLAY, and CF-RICE, which support emission monitoring, calculation, and sustainable rice practices. It also introduces various emission measurement methods, such as automated and manual chamber systems, eddy covariance, photo-acoustic spectroscopy, standardized GHG calculators, and measurement guidelines. Additionally, it provides a lists of advanced rice cultivation practices covering rice varieties and seedling methods, tillage practices, water and straw management, etc. The platform offers guidance and templates on Nationally Appropriate Mitigation Action (NAMA) planning, low-emission rice production investments, GHG sampling and estimation, national MRV systems, and farmer questionnaires. Insights from field trials and case studies, particularly on alternate wetting and drying (AWD), highlight the platform's ability to achieve significant GHG reductions while delivering ecological and economic co-benefits.

02 THEME: GHG emission inventory; Climate smart and Net-zero toolkit

The MRV Platform for Agriculture

CGIAR Research Program on Climate Change, Food Security and Agriculture (CCAFS) | Source |

The MRV Platform for Agriculture, an initiative by the Global Research Alliance for Agricultural Greenhouse Gases (GRA) and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), in partnership with Unique Forestry and Land Use, serves as a comprehensive resource for agricultural mitigation. Initially focused on livestock MRV systems in 2018, the platform has since expanded to include rice, agroforestry, and, by 2021, nutrient management and soil organic carbon, with plans to incorporate additional sectors and cross-cutting issues over time.

The platform provides guidance for designing technical and institutional MRV systems to support agricultural mitigation efforts, such as Nationally Determined Contributions (NDCs) and Nationally Appropriate Mitigation Actions (NAMAs). Its knowledge portal offers a range of resources featuring

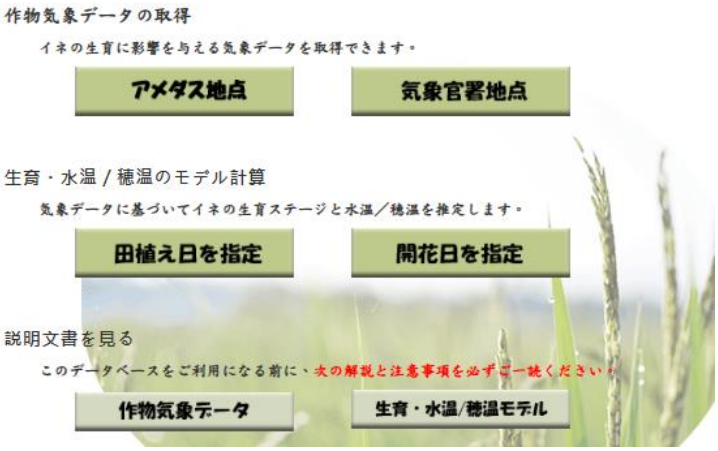
tools for measuring GHGs, compiling inventories, as well as MRV in practices and case studies of different MRV topics, farming systems, and regions.

Additionally, tools like CCAFS' SAMPLES (Standard Assessment of Agricultural Mitigation Potential and Livelihoods) project provide standardized methods for measuring agricultural GHGs and identifying mitigation strategies compatible with food security. The platform's emphasis on practical applications and shared experiences equips practitioners, policymakers, and researchers with valuable insights to improve MRV systems and enhance global mitigation efforts. By integrating advanced methods and tools, the MRV Platform plays a vital role in addressing climate change within the agriculture sector.

03 THEME: Climate smart and Net-zero toolkit; Agrifood system; Environment and climate

Model-Integrated Crop Meteorological Database (Meteocrop DB)

National Agriculture and Food Research Organization (NARO), Japan | Source | (In Japanese)



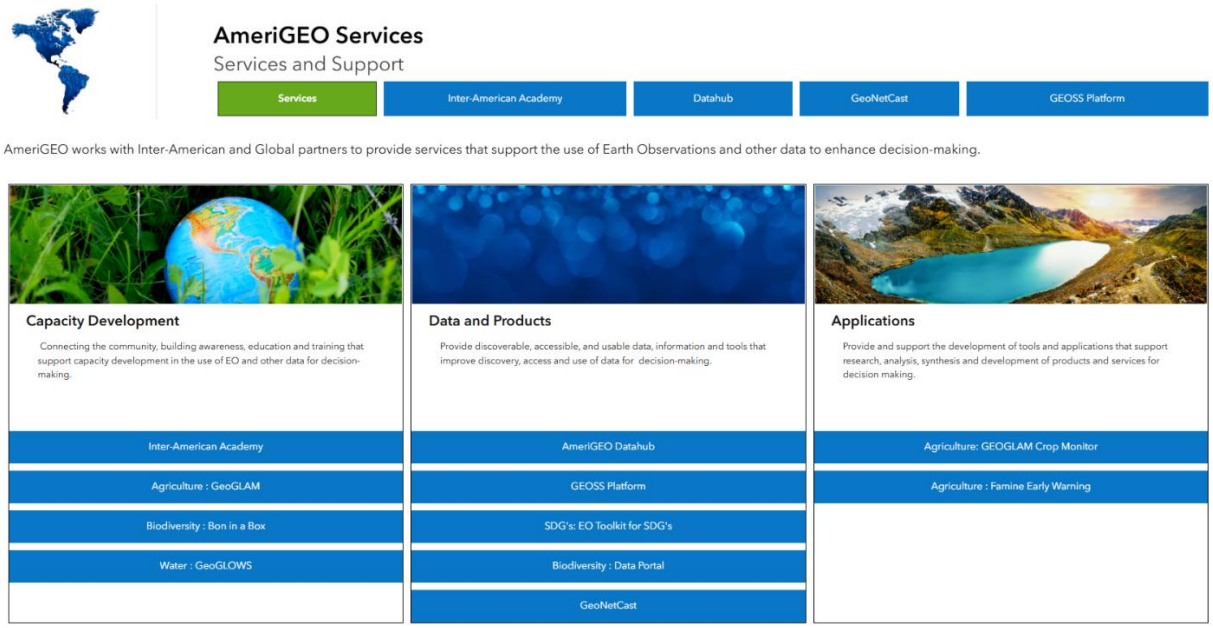
The Model-Integrated Crop Weather Database provides key meteorological data, including solar radiation, humidity and evapotranspiration that affect rice growth, from AMeDAS (Automated Meteorological Data Acquisition System) and weather station sites across Japan. It estimates rice growth conditions at selected locations and assesses microclimatic factors in paddy fields, such as water temperature and rice ear temperature, which affect yield and ripening. By integrating with existing crop databases and trail data, it facilitates analysis of the impact of climate change on rice production, supporting future yield projections, risk assessment and adaptation strategies.

04 THEME: Climate smart and Net-zero toolkit; Environment and climate; Others

Advancing Data Driven Decision Making in the Americas

Americas Group on Earth Observations (AmeriGEO) | Source |

The AmeriGEO initiative fosters collaboration among Group on Earth Observations (GEO) members across the Americas to ensure decisions benefiting the region are guided by comprehensive and sustained Earth observation data. Prioritizing five key Societal Benefit Areas (SBAs): **Food Security and Sustainable Agriculture; Biodiversity and Ecosystem Sustainability; Disaster Resilience**; **Public Health Surveillance; Water Resources Management** chosen by member nations, AmeriGEO works with regional and global partners to enhance decision-making through capacity development, accessible data, and practical applications.



The initiative provides tools like the DataHub, GEOSS Portal, and GeoNetCast, which enable users to discover and access diverse Earth observation resources worldwide. It also supports the development of tools such as GEOGLAM Crop Monitor, which delivers timely, science-based insights on crop conditions to improve market transparency and anticipate production shortfalls. Through its Inter-American Academy, AmeriGEO strengthens awareness, education, and capacity building, empowering communities to utilize Earth observation data for informed decision-making and innovative solutions to regional challenges.

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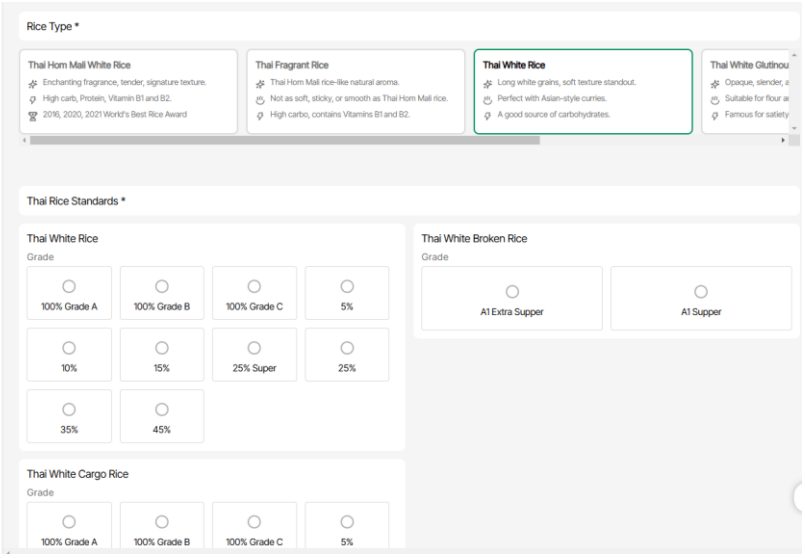
05 THEME: Agrifood system; Others

Thai RiceHub

EASYRICE | Source |

Rice Hub, developed by EASYRICE, connects over 270 manufacturers across Thailand, providing importers, exporters and food distributors with access to premium Thai rice. The platform features an AI-powered inspection system and a comprehensive catalog that provides detailed descriptions of rice varieties, the Thai Rice Standard set by the Ministry of Commerce, and a range of products to meet different needs. It also provides up-to-date statistics on Thai rice prices, giving stakeholders the insight they need to make informed business decisions and navigate the Thai rice market seamlessly.


RiceHub / Make your order
② Please select a standard
Rice Type
Thai White Rice
Thai Rice Standards
Certification
Packaging Material :
Order Amount *
Moisture
12.00 %Max
Weight
Master Pack*
Sample
* The images are for decision-making purposes only.


Rice Type *
Thai Hom Mali White Rice
Enchanting fragrance, tender, signature texture.
High carb, Protein, Vitamin B1 and B2.
2016, 2020, 2021 World's Best Rice Award
Thai Fragrant Rice
Thai Hom Mali rice-like natural aroma.
Not as soft, sticky, or smooth as Thai Hom Mali rice.
High carbo, contains Vitamins B1 and B2.
Thai White Rice
Long white grains, soft texture standout.
Perfect with Asian-style curries.
A good source of carbohydrates.
Thai White Glutinou
Opaque, slender, a
Suitable for flour a
Famous for satiety
Thai Rice Standards *
Thai White Rice
Grade
100% Grade A
100% Grade B
100% Grade C
5%
10%
15%
25% Super
25%
35%
45%
Thai White Broken Rice
Grade
A1 Extra Supper
A1 Supper
Thai White Cargo Rice
Grade
100% Grade A
100% Grade B
100% Grade C
5%

EVENT

01

The 5th Global Conference on Agriculture

March 13-15, 2025 | Hybrid | Berlin, Germany | Source |

The 5th Global Conference on Agriculture will take place from 13 to 15 March 2025 in Berlin, Germany. This three-day hybrid event will provide presentations, insights, networking opportunities and workshops for researchers, AgTech companies, institutions, cooperatives and policy makers. The central role of agriculture in global health, development and the environment will be explored, with a focus on emerging technologies that offer solutions to global challenges. Key themes include:

- Agricultural Biodiversity
- Agricultural Biology
- Agricultural Economics
- Agriculture Technology
- Agroecology
- Sustainable Plant Production
- Dairy, Poultry and Livestock Farming
- Environment and Powering Agriculture
- Greenhouse and Horticulture
- Impact of COVID-19 Pandemic on Food and Agriculture
- Postharvest Management

The conference provides a unique platform for industry leaders, researchers and academics to collaborate and drive impactful change in agriculture. The abstract submission deadline is 27 February 2025 and registration for the conference is open until 6 March 2025.

02

The 11th International Conference on Agricultural and Biological Sciences (ABS 2025)

July 21-24, 2025 | In-person | Matsue, Japan | Source |

The 11th International Conference on Agricultural and Biological Sciences (ABS 2025) will be held in Matsue, Japan, from July 21 to 24, 2025. Building on the success of previous conferences, ABS 2025 will provide a platform for international and interdisciplinary exchanges in agricultural and biological sciences, including animal, plant, soil and environmental sciences. The 4-day conference will feature plenary lectures, oral and poster presentations, workshops, discussions, and networking events designed to engage participants in learning and collaboration. The deadline for online submission of abstracts and full papers is open until 25 January 2025.

03

International Symposium on Agricultural Meteorology 2025 (ISAM2025)

March 13-16, 2025 | In-person | Kumamoto, Japan | Source |

The 2025 National Conference of the Japan Society of Agricultural Meteorology (held in Japanese) and the International Symposium on Agricultural Meteorology (ISAM 2025, held in Japanese and English) will be hosted in the Tokai University Kumamoto Campus, from 13 to 16 March 2025. This combined event will bring together experts, researchers and professionals in agricultural meteorology to discuss emerging issues such as climate change, weather forecasting and their impact on agriculture. It aims to foster collaboration, share research results and develop innovative solutions to address critical challenges in agricultural meteorology.

農業気象国際シンポジウム（ISAM2025）

ISAM participants can also participate in all parallel Japanese sessions. Schedule is subject to change.

Date		Events
Thursday, March 13th 2025	13:00-15:00	Symposium (only in Japanese)
	15:00-17:00	Oral Session
Friday, March 14th	10:00-11:30	Oral Session
	12:30-14:00	Award winners lecture (only in Japanese)
	14:00-15:30	Oral Session
	15:30-17:30	Poster Session
	19:00～21:00	General Banquet
Saturday, March 15th	10:00～12:00	Public Outreach Symposium (only in Japanese)
Sunday, March 16th	excursion	

04

The 72nd Annual Meeting of the Ecological Society of Japan

March 15-18, 2025 | Hybrid | Sapporo, Japan | Source |

The Ecological Society of Japan 2025 Annual Meeting will be held from 15 to 18 May 2025 in Sapporo, Japan. This hybrid event will bring together ecologists, researchers and practitioners to discuss the latest developments in ecological science. Topics will include biodiversity conservation, ecosystem services, climate change and ecological restoration. Two themes "Acoustic Ecology" and "Deer-induced Problems" have been selected for the Open Sessions, and the ER Symposia will present "Species responses to climate change in terrestrial and aquatic ecosystems". The event will provide opportunities for networking,

ESJ 72 Sapporo Online 第72回 日本生態学会大会 The 72nd Annual Meeting of the Ecological Society of Japan

knowledge exchange and collaboration across disciplines. Registration is now open and participants can attend in person or online.

05

International Conference on Agriculture Engineering (Agritech 2025)

June 23-24, 2025 | Hybrid | Berlin, Germany | Source |

The International Conference on Agriculture Engineering will take place on 23-24 June 2025 in Berlin, Germany. The event, themed "Cultivating Innovation: Engineering the Future of Agriculture", aims to bring together academic researchers, scientists, technical experts and students to share experiences and research results and discuss the latest trends and challenges in agricultural engineering. The 2-day event will be divided into six sessions covering topics such as:

- Agriculture Economics | Agriculture Business | Digital agriculture | Polyhouse agriculture
- Agriculture production systems | Biotechnology in agriculture | Precision agriculture | Farm machinery and equipment
- Automation and robotics in agriculture | Environmental control in agriculture | Environmental impact | Climate smart agriculture
- Food safety and quality engineering | Sustainable agriculture practices | Irrigation and drainage systems | Harvest technologies
- Agronomy | Horticulture | Regenerate natural systems | Design out waste
- Food and dairy agriculture biotechnology | Nanotechnology in agriculture | Principles of Soil and Water Engineering | Agro Processing

Participants will have the opportunity to present their work, chair sessions, network with experts from over 22 countries and collaborate on innovative solutions. Abstract submissions are now open for keynote/oral/poster presentations and key dates include regular registration on 31 January 2025 and late bird registration on 28 April 2025. The event will also offer hybrid participation options, allowing attendees to participate virtually as a presenter or audience member.

06

European Geosciences Union (EGU) General Assembly 2025

April 27 - May 2, 2025 | Hybrid | Vienna, Austria | Source |

The European Geosciences Union (EGU) General Assembly is one of the largest geoscience gatherings, and EGU25 will take place from 27 April to 2 May 2025 in Vienna, Austria. This hybrid event will bring together geoscientists, researchers and experts from around the world to discuss

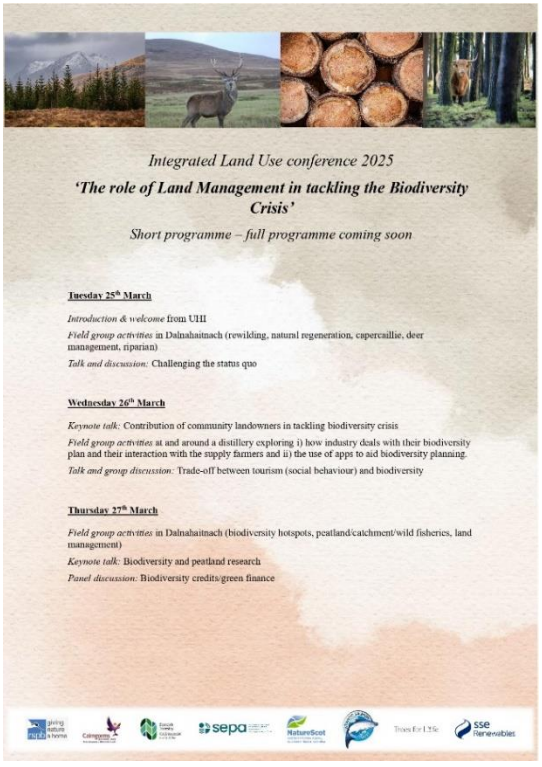
the latest research and advances in Earth, Planetary and Space Sciences. It will offer a wide range of sessions, workshops and networking opportunities to foster collaboration across all fields of geoscience. The event will be accessible both in person and online, allowing for global participation. EGU25 abstract submission is now open until 15 January 2025, 13:00 CET. Financial support is available until 2 December 2024.

EGU General Assembly 2025 Vienna, Austria & Online | 27 April–2 May 2025

07

The Integrated Land Use Conference (ILUC) 2025

March 25-27, 2025 | In-person | Carrbridge, Scotland, UK | Source |



The Integrated Land Use Conference (ILUC) was initiated by the University of the Highlands and Islands (UHI) in response to industry concerns about the breadth of focus of land managers. Held annually in Carrbridge, Scotland, the conference aims to bring together students from a range of land-based disciplines and encourage interdisciplinary learning, collaboration and professional networking. ILUC focuses on the integrated management of natural resources, promoting their conservation and sustainable use while ensuring equitable outcomes for stakeholders.

The 2025 Conference will take place from 25-27 March 2025 focusing on the role of land management in addressing the biodiversity crisis. The event will feature keynote talks on the contribution of community landowners in tackling the biodiversity crisis and research on biodiversity and peatlands. Field group activities will cover topics such as rewilding, natural regeneration, capercaillie, deer management, riparian areas, industry biodiversity plans, biodiversity hotspots, peatland/catchment/wild fisheries and land management. Group and panel discussions will focus on challenging the status quo, the trade-off between tourism and biodiversity, and biodiversity credits/green finance.

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The 4th Annual AI in Agriculture Conference

March 31 - April 2, 2025 | In-person | Mississippi, USA | Source |

The 4th annual AI in Agriculture and Natural Resources Conference, hosted by Mississippi State University (MSU), will take place from March 31 to April 2, 2025. The theme for this year's conference is "the role of AI in autonomous agricultural systems and socioeconomic effects." The event aims to enhance knowledge of AI in agriculture, share ongoing work, and foster collaboration among U.S. university faculty, students, industry professionals, and stakeholders, with the goal of improving food security and agricultural livelihoods through effective and socio-economically mindful implementation of AI technology. The conference will feature keynote speeches, panel discussions, and poster sessions, along with concurrent breakout sessions. The preliminary agenda includes topics on cloud-based tools for labeling and training object detection models, and building an ag-knowledgeable chatbot. Abstract submissions for oral presentations are now open online until January 6, 2025. The deadline for abstract submission of student poster presentations is February 14, 2025.