Issue 15-1
June 15, 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 agri-food system and climate smart agriculture, including research, news, policy, data and event updates around the world on the project website.

Issue Highlight: Agricultural soil health, carbon analysis and modeling
The management of agricultural soil carbon and soil greenhouse gas emissions involves complex interplay of cover vegetation, agricultural practices, soil ecology and biochemistry, structure of root zone, etc. This issue highlights recent updates on scientific factors and processes affecting soil organic carbon stability, updates on soil carbon management guidelines such as Verra's on-going revision of agricultural land management methodology, Environmental Defense Fund's report on modeling soil carbon and greenhouse gas emissions, and a dataset for soil organic carbon in agricultural systems for the Southeast Asia region.

Content

Research

01 THEME: Carbon sequestration

Size, distribution, and vulnerability of the global soil inorganic carbon

April 11, 2024 | Science | Source |

Introduction: Recent evidence challenges the traditional view of soil inorganic carbon (SIC) as stable, revealing rapid dynamics impacting soil health and carbon cycling. For example, SIC influences acidity buffering, nutrient availability, and vice versa. Chinese Academy of Science forms a global research consortium in assessing the quantity, distribution, and vulnerability of the global soil inorganic carbon stock.

Key findings: By analyzing a vast array of field data, the researchers conclude that soils worldwide hold a substantial amount of carbon in the form of SIC, totaling over 2,300 billion tonnes. They highlight the vulnerability of SIC to soil acidification caused by nitrogen inputs, with potential losses posing a risk to carbon sequestration efforts. The study emphasizes the interconnectedness of SIC with atmospheric and hydrospheric carbon dynamics, stressing its overlooked role in shaping climate outcomes. The study underscores the need for a nuanced understanding of SIC dynamics to inform effective carbon management strategies. By considering factors such as soil pH, nitrogen deposition, and land use practices, researchers can better predict and mitigate the impacts of SIC alterations on global carbon budgets.

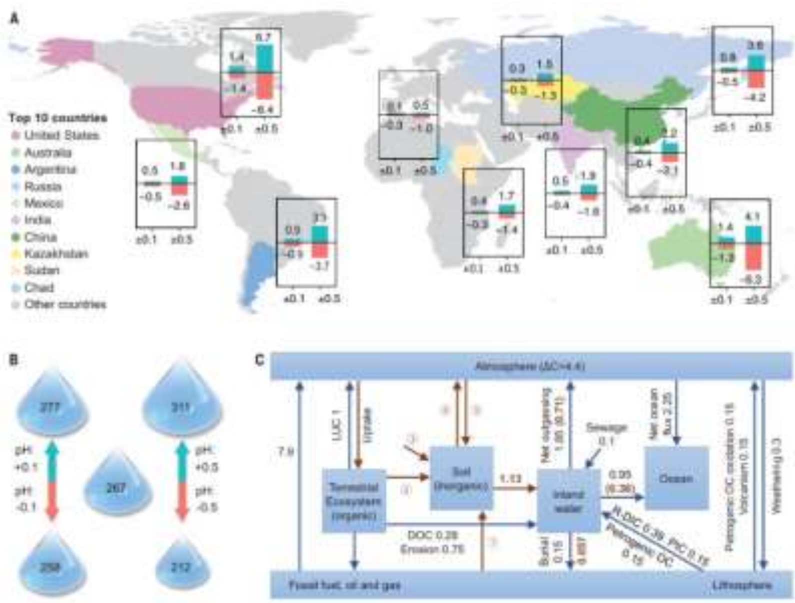


Figure | SIC-relevant global budgets. (A) Changes in SIC (top 0.3 m) in response to soil pH by countries. Cyan bars (in units of GtC) indicate the gain of SIC in response to a higher pH (by two levels: 0.1 and 0.5), whereas red bars show the loss in response to acidification. We show the top 10 countries rankedby SIC losses (pH reduction by 0.1) from high to low. (B) Global SIC stock (top 0.3 m, in units of GtC) in response to soil pH. (C) Flowchart of the present day global carbon budget (in units of GtC yr^{-1}) accounting for inorganic carbon exchanges through soil. Fluxes that have been altered owing to the inclusion of inorganic carbon through soils are in brown, whereas fluxes in blue arrows are adapted from references. In brackets are the contributions of SIC to total fluxes (in the case of more than one contributing sources). We used Terrestrial Ecosystem to refer to land that excludes inland waters. DOC, dissolved organic carbon export from leaching and runoff; R-DIC, lateral inorganic carbon export from bedrock weathering; PIC, physical erosion of total recalcitrant particulate inorganic carbon; petrogenic OC, organic carbon export from fossil and old soil; erosion, lateral organic carbon export from water, wind, and tillage erosions. Pathway 1 represents the inorganic carbon flux from rock to soil, and its contribution to inland-water is accounted through R-DIC; pathway 2 represents SIC fluxes sourced from terrestrial biological system (e.g., respiration); pathway 3 is external inorganic carbon inputs into soils (e.g., lime); and pathways 4 and 5 are carbon exchanges between SIC and the atmosphere.

02 THEME: Carbon sequestration; ICT in agrifood sustainability; MRV (measurement, reporting, verification)

Going deep: Roots, carbon, and analyzing subsoil carbon dynamics

January 01, 2024 | Molecular Plant | Source |

Comment: Agricultural practices contribute significantly to atmospheric greenhouse gas emissions, with tillage accelerating soil disruption and carbon release. Research consortium led by Alliance of Bioversity International and CIAT advocates that meeting the triple challenge of increasing food production, achieving net zero carbon emissions, and addressing climate change impacts requires multifaceted approaches, conservation agriculture that promote accumulaion of soil organic carbon (SOC) accumulation through deeper rooting is crucial, and understanding root systems and biophysical features facilitating deep soil penetration is key.

Despite improved insights into deeper-rooting ability, its impact on carbon sequestration remains complex due to practical constraints and real-field variability. Complexities in climates, soil types, and plant roots pose challenges. Leveraging advanced phenotyping technologies and isotopic methods offers avenues for deeper understanding. Machine learning models incorporating depth-related data can enhance predictive insights into SOC dynamics. Exploring deeper-rooting genotypes holds promise for increasing carbon input into soils while enhancing crop yields. Genetic and genomic approaches, including gene editing, offer opportunities to develop more efficient cropping systems. Harnessing genetic diversity in crop varieties becomes crucial for sustainable agricultural practices amidst increasing demands on arable land.

A B

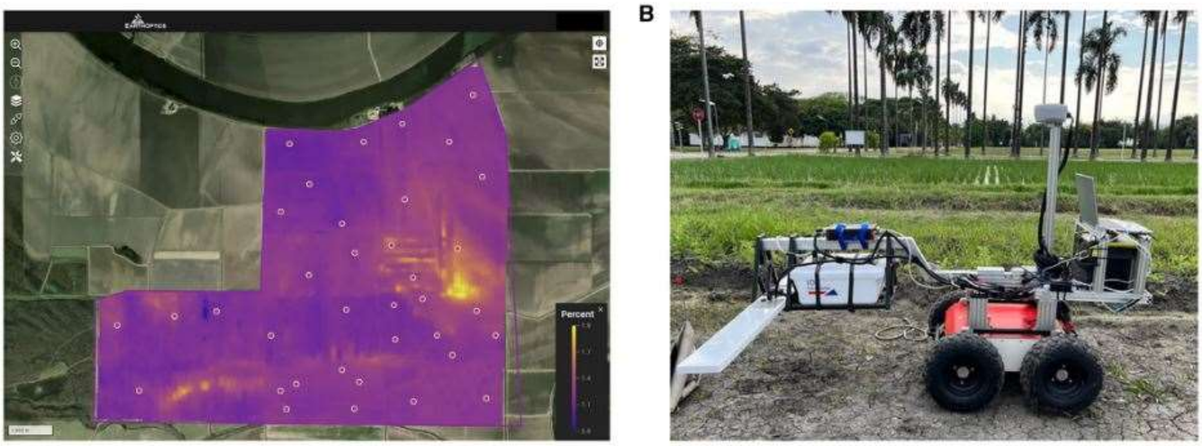


Figure | Agricultural technology advancements: Carbon mapping and robotic field scanning. (A) Predicted carbon map of a Mississippi soybean-corn field. The red points on the map indicate the total number of ground-truth data points collected. This field experiment encompasses a vast area of 414 ha. The predicted carbon map demonstrates a high degree of accuracy, with a mean absolute error of just 0.149 (percentage of total carbon) and a mean absolute percentage error of 14.2%. (B) GroundOwl sensor system integrated with a robot for automated field scanning at the Alliance of Bioversity International and CIAT in Cali, Colombia.

03 THEME: GHG emission reduction

Intermediate soil acidification induces highest nitrous oxide emissions

March 27, 2024 | Nature Communications | Source |

Introduction: Recent research has uncovered significant insights into the factors driving nitrous oxide (N_2O) emissions from soil, a potent greenhouse gas contributing to climate change. Chinese Science Academy led a global team of scientists in conducting global syntheses and field experiments to understand the relationship between soil pH and N_2O emissions,

Key findings: The studay reveals that soil acidity primarily controls N_2O emissions by influencing the composition of denitrifying microorganisms. Moderately acidic soils, rather unexpectedly, exhibit the highest N_2O emissions due to favoring N_2O-producing over N_2O-consuming microorganisms. This challenges previous assumptions and suggests that simply adjusting soil pH may not be enough to mitigate N_2O emissions effectively. The research underscores the importance of understanding the complex dynamics within soil ecosystems for developing more targeted strategies to reduce N_2O emissions. Innovative approaches targeting microbial communities could offer promising avenues for mitigating N_2O emissions, highlighting the need for alternative strategies beyond traditional soil pH adjustments.

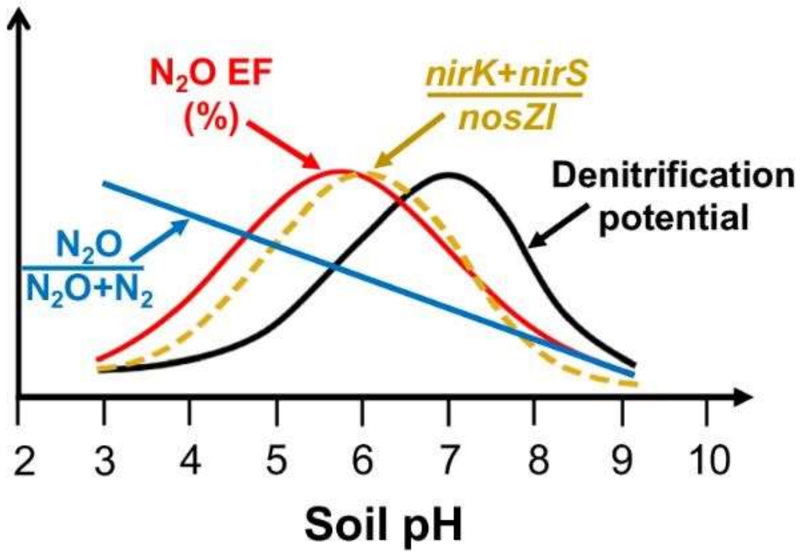


Figure | A conceptual framework illustrating the relationships between soil pH and the denitrification product ratio, N_2O emission factor (EF), denitrifier community composition, and the denitrification potential. The denitrification product ratio [i.e., $N_2O/(N_2O+N_2)$] is the proportion of denitrification terminating with N_2O, and the N_2O EF is the proportion of fertilizer nitrogen (N) emitted as N_2O (%). The denitrifier community composition is expressed as the ratio between the abundances of N_2O-producing (nirK+nirS) and N_2O-consuming (nosZI) micro organisms. Soil denitrification potential is usually expressed in mg N kg^{-1} h^{-1}.

04 THEME: Carbon sequestration; GHG emission reduction

Effects of management practices on the ecosystem-service multifunctionality of temperate grasslands

May 07, 2024 | Nature Communications | [Source](#) |

Introduction: Providing sustainably produced food while safeguarding ecosystem services is a global challenge. Researchers from Institute of Agricultural Sciences in Switzerland investigate the effectiveness of three grassland management practices—organic production, extensive management, and harvest type—on enhancing ecosystem-service multifunctionality by analyzing 22 indicators across 86 grasslands in Switzerland.

Key findings: The findings reveal that while organic farming has limited impact, Eco-scheme and harvest type significantly influence ecosystem services. Eco-scheme, which prohibits fertilization, improves cultural services but reduces provisioning services like biomass yield. Similarly, pastures enhance cultural services but may trade-off with some provisioning services. The positive effects of Eco-scheme and pasture are mainly due to reduced land-use intensity, such as lower fertilizer input and less frequent harvesting.

Ultimately, the study suggests that diversifying grassland management across landscapes can improve ecosystem-service multifunctionality, meeting various societal needs. Combining these management practices strategically can optimize the provision of services that are in short supply, supporting more sustainable and resilient agricultural systems.

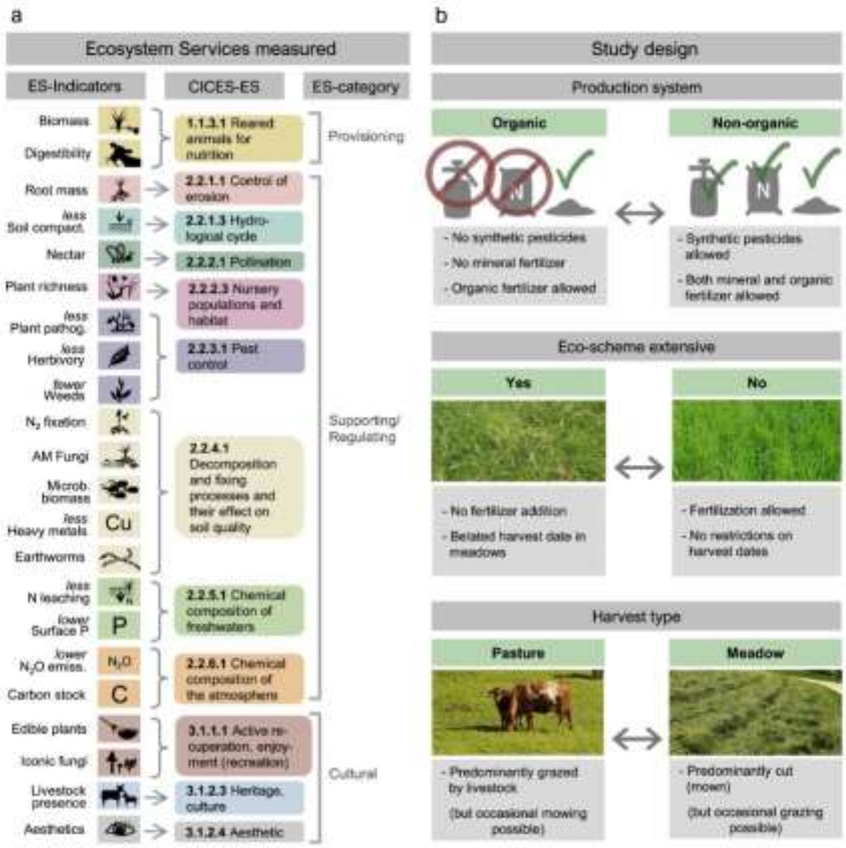


Figure | Overview of measured ecosystem-service indicators (ES-indicators) and study design. a From left to right: indicators grouped according to the corresponding ecosystem service defined by CICES29 and corresponding ecosystem-service category. b From top to bottom: brief definition of the three management aspects studied: Production system, Eco-scheme, and Harvest type. All 22 ecosystem service indicators were measured for the eight possiblec ombinations of Production system, Eco-scheme, and Harvest type. Total number of study plots was 86.

05 THEME: Policy incentives, financing, pricing

Agri-environmental policies from 1960 to 2022

April 01, 2024 | Nature Food | Source |

Introduction: The 2020s is dubbed 'the decade of ecosystem restoration' by the UN, and global agricultural challenges is in the spotlight. Agricultural Economics and Policy Group of ETH Zurich in Switzerlandand compiles a comprehensive database of agricultural-environmental policies, bridging information gaps between environmental impact and economic development, and conducts analyses, linking policy measures to economic growth, and assessing their impact on cropland soil erosion mitigation.

Key findings: This study introduces a database cataloging over 6,000 agri-environmental policies worldwide from 1960 to 2022. The database encompasses various policy types and goals, aiding research on economic development's association with environmental policies and their impact on issues like soil erosion. Analyses reveal a positive link between economic development and policy implementation, with certain high-income countries lagging in environmental measures. Moreover, the database facilitates investigations into the role of policies in mitigating global border discontinuities in soil erosion, with findings suggesting that policies explain a significant portion of such disparities. This resource enhances understanding of global environmental policy landscapes and informs strategies for sustainable agriculture and environmental conservation.

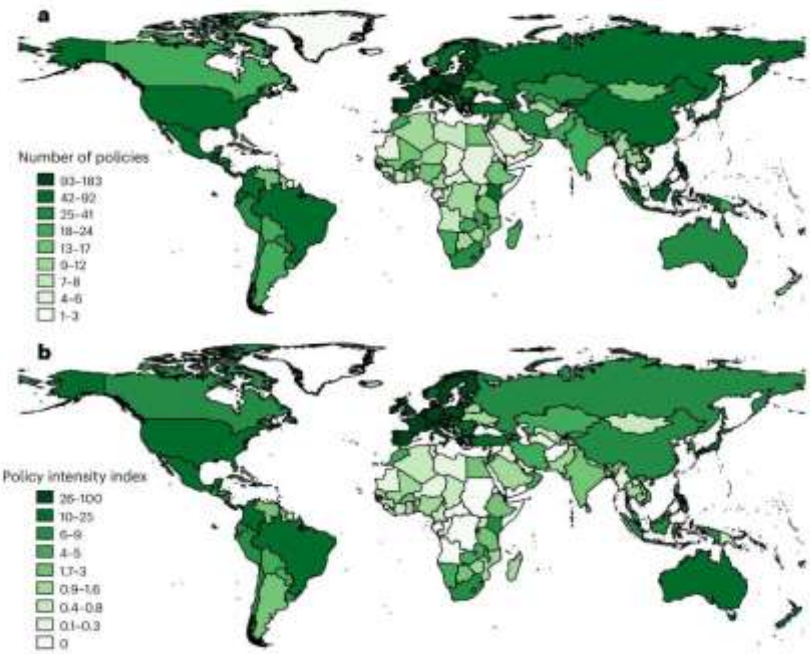
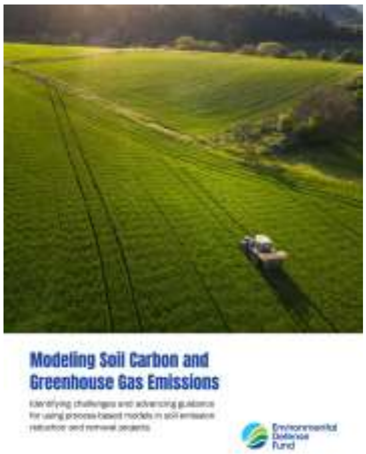


Figure | Number of agri-environmental policies and policy intensity index per country. a, A simple count of each country's regulations, frameworks, payment programs and so on may offer hints into agri-environmental policy efforts, but ignores important policy characteristics such as ambition, targeting, stringency and enforcement. b, An alternative is to use a more complex metric by taking into account the general policy stringency and enforcement of these countries or the level of corruption they face. Arguably, agri-environmental policies are on average more effective when implemented by and in countries that generally have more stringent and better-enforced environmental policies and lower levels of corruption. By weighting the simple measure shown in a by these factors, an augmented measure can be obtained, as shown in b (Methods). EU member
states have their own policies plus those of the EU.

06 THEME: MRV (measurement, reporting, verification)

Modeling Soil Carbon and Greenhouse Gas Emissions

Environmental Defense Fund | Source | Download |



Agricultural soils globally are critical for reducing greenhouse gas (GHG) emissions and increasing soil organic carbon (SOC) stocks, vital for climate goals. Direct measurements of these changes are costly and time-consuming, making process-based biogeochemical models essential for accurate quantification in large-scale projects like carbon markets. However, challenges such as model consistency and transparency must be addressed to ensure reliable GHG and SOC assessments. This report by Environmental Defense Fund offers recommendations to enhance model use, emphasizing rigorous validation, uncertainty quantification, and adherence to standardized protocols to bolster confidence in agricultural GHG mitigation strategies.

Challenges: The use of process-based models faces challenges including inconsistent approaches, uncertainties in model outputs, and issues of trust. Variability in modeling workflows and uncertainty quantification methods contributes to discrepancies in results.

Recommendations

- **Consistency in Modeling Workflow:** Ensure consistency across all project stages (calibration, validation, prediction, true-up) to minimize uncertainty and potential for manipulation.
- **Validation Data Quality:** Use robust validation data covering spatial and temporal dimensions to accurately represent project contexts.
- **Time-Dependent Prediction Errors:** Account for increased prediction error over longer time spans, aligning assumptions conservatively with validation data.
- **Correlated Measurement and Model Errors:** Recognize spatial dependencies in errors to refine uncertainty calculations and improve accuracy.
- **Systematic Model Error Handling:** Address systematic biases through innovative validation approaches across diverse contexts (crop types, soil properties, climate regions).
- **Benchmarking Platform:** Establish a shared platform for model validation against standardized datasets to enhance transparency and mitigate gaming risks.

Conclusion: Implementing these recommendations will bolster the reliability, transparency, and confidence in process-based models for agricultural soil GHG and SOC projects. This framework ensures rigorous protocol design and fosters consistent, credible outcomes essential for effective climate mitigation strategies.

News

01 THEME: Carbon sequestration; GHG emission reduction; MRV (measurement, reporting, verification)

Verra initiates revision of agricultural land management methodology

May 17, 2024 | Verra |

Verra is launching a significant revision to the VM0042 Methodology for Improved Agricultural Land Management, leading to version 3.0. This update, critical for scaling regenerative agriculture projects, aims to enhance measurement, reporting, and verification processes. Key changes include:

- Improved standardization for land stratification, soil sampling, and laboratory analysis of soil organic carbon (SOC) stocks.
- A new flexible “blended baseline” approach for accommodating varying crop rotations.
- Alignment of woody biomass quantification with the Verified Carbon Standard (VCS) Methodology VM0047.
- Clarification of repeated measurements for quantifying SOC stock changes.

Verra, with consultancy support from TerraCarbon, plans to conduct a formal public consultation on the draft for Q4 2024, with the final version expected in the first half of 2025.

02 **THEME:** Policy incentives, financing, pricing

USDA easing producers' transition to organic production with new programs and partnerships, announces investments to create and expand organic markets

May 15, 2024 | USDA |

Agriculture Secretary Tom Vilsack announced new initiatives, partnerships, and $10 million in additional funding to expand organic markets and aid farmers transitioning to organic production. The USDA aims to support market development, provide training for transitioning producers, and ease certification costs. The Organic Market Development Grant program will allocate $24.8 million to 23 projects, benefiting 49,000 producers and 118 million consumers. Additionally, the Natural Resources Conservation Service (NRCS) will invest $5 million in partnerships for organic training. The Farm Service Agency (FSA) will cover up to 75% of organic certification costs. These efforts aim to increase access to profitable markets, reduce reliance on imports, and support small to mid-sized producers, furthering USDA's commitment to resilient, equitable food systems.

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

Indonesia revokes license of world's largest forestry offsets project

April 30, 2024 | The Straits Time |

In Jakarta, the Indonesian government has revoked the license of one of the world's largest carbon offsets projects in Central Kalimantan, Borneo, covering over 36,000 hectares. Rimba Raya Conservation, responsible for issuing more than 30 million credits since 2013, faces allegations of violating local regulations by transferring its license without approval, exceeding its sanctioned area, and failing to make required payments. This move raises uncertainties for carbon markets, traders, and companies relying on Rimba Raya credits to offset emissions. It underscores the risks associated with complex carbon offset schemes amid evolving government regulations. The development could impact partners like Hong Kong-based InfiniteEarth, which markets the project and is seeking clarity from Indonesian authorities. Toronto-based Carbon Streaming, set to buy millions of credits, is also awaiting further updates.

04 **THEME:** Policy incentives, financing, pricing

Global carbon pricing revenues top a record $100 billion

May 21, 2024 | The World Bank |

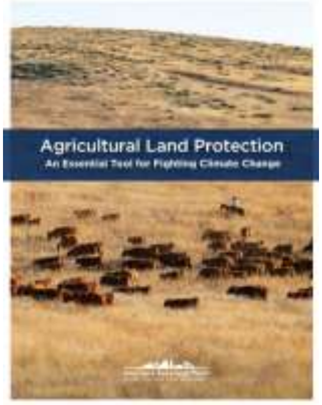
The World Bank's latest "State and Trends of Carbon Pricing 2024" report reveals that global carbon pricing revenues soared to a record $104 billion in 2023. With 75 carbon pricing instruments operational worldwide, over half of this revenue was allocated to funding climate and nature programs. Despite covering 24% of global emissions, up from 7% two decades ago, carbon pricing remains insufficient to meet Paris Agreement goals. The report highlights progress in middle-income countries like Brazil, India, and Turkey, expanding carbon pricing into sectors like aviation and shipping. However, it emphasizes the urgent need for broader and higher carbon pricing to effectively curb emissions and bridge the gap between climate commitments and policy implementation globally.

Policy

01 THEME: Climate smart agriculture

Agricultural Land Protection: An Essential Tool for Fighting Climate Change

American Farmland Trust | Source | Download |



Agricultural conservation easements are pivotal in preserving productive farmland from development, safeguarding food security, and bolstering rural economies. With 2,000 acres lost daily to urban sprawl in the U.S., easements ensure these lands remain available for agriculture while mitigating greenhouse gas (GHG) emissions associated with land conversion.

Key Benefits

- **GHG Emissions Reduction:** Easements prevent agricultural land from being converted into higher-emission urban uses, significantly reducing GHG emissions. For instance, urban areas emit up to 66 times more GHGs per acre than agricultural land.
- **Promoting Climate-Smart Practices:** Easements encourage farmers to adopt carbon-sequestering practices like conservation tillage and cover cropping, supported by the sale proceeds. This adoption contributes to building climate resilience and enhances carbon sequestration potential.
- **Preserving Carbon Sinks:** Conserved lands retain their capacity to sequester carbon, whether or not immediate practices are in place, safeguarding long-term environmental benefits.

Program Impact: In FY21, California's SALC program invested $65 million to protect 27,000 acres, preventing an estimated 2.4 million metric tons of CO2 equivalents. This demonstrates the tangible climate benefits achievable through agricultural easements.

Challenges and Recommendations

- **Scaling Up Funding:** Increased federal, state, and local funding is crucial to expand easement programs nationwide, given the significant demand and limited availability under current schemes.
- **Enhanced Program Evaluation:** Standardized methodologies for quantifying climate benefits across easement programs are essential to ensure transparency and effectiveness.

02 THEME: Nature-based solutions; Net Zero; Supply chain

UK third National Adaptation Programme (NAP3)

UK Department for Environment, Food & Rural Affairs | Source | Download |

The UK's NAP3 outlines a comprehensive strategy over the next five years to enhance the country's resilience to climate change. Building on previous initiatives, it aims to address current and future climate impacts through coordinated action across sectors.

Key Focus Areas

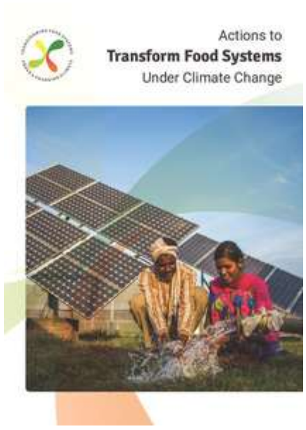
- **Infrastructure:** Implementing a strategic resilience framework and accelerating investment in water quality and supply to safeguard critical infrastructure.
- **Natural Environment:** Incorporating climate adaptation into land management schemes, promoting nature recovery projects, and addressing climate hazards through local strategies.
- **Health, Communities, and Built Environment:** Investing in flood and coastal erosion schemes, deploying health plans for adverse weather, and updating planning policies to enhance resilience.
- **Business and Industry:** Collaborating with industry to deliver green finance strategies, strengthen supply chains, and support businesses in adapting to climate impacts.
- **International Impacts:** Tripling adaptation funding for vulnerable communities, driving international consensus on climate adaptation, and enhancing reporting mechanisms.

Adaptation Reporting Power: Streamlining reporting requirements to improve effectiveness, expanding scope to include additional sectors like health and food supply, and supporting evidence-based decision-making through research initiatives.

03 THEME: Carbon market; Climate smart agriculture; Net Zero; Supply chain; Sustainable consumption

Actions to transform food systems under climate change

CGIAR | Source | Download |



The current state of global food systems is inadequate, marked by failures in production, nutrition, equity, and environmental sustainability. Climate change exacerbates these challenges, demanding immediate attention to prevent catastrophic consequences.

Challenges and Targets: Existing targets, such as zero hunger by 2030 and climate mitigation goals, remain unmet. Climate-related disasters are escalating, threatening vulnerable populations. Urgent action is needed to avert a crisis.

Proposed actions: Eleven transformative actions are proposed, each with defined goals, mechanisms, and target areas. Collaboration among stakeholders is essential, with roles outlined for agencies, initiatives, and organizations

- **Area 1 Reroute Farming and Livelihoods:** Promote climate-resilient practices, reduce inequality, and ensure dietary needs are met.
  - **Action 1.1** Ensure zero agricultural land expansion on high-carbon landscapes
  - **Action 1.2** Enable markets and public sector actions to incentivize climate-resilient and low emission practices
  - **Action 1.3** Support prosperity through mobility and rural reinvigoration

- **Area 2 De-Risk Livelihoods:** Implement inclusive early warning systems and adaptive safety nets to mitigate the impact of extreme weather events.
  - **Action 2.1** Secure resilient livelihoods and value chains through early warning systems and adaptive safety nets
  - **Action 2.2.** Help farmers make better choices

- **Area 3 Reduce Emissions from Diets:** Encourage dietary shifts and minimize food loss and waste to curb emissions.
  - **Action 3.1** Shift to healthy and sustainable climate-friendly diets
  - **Action 3.2** Reduce food loss and waste

- **Area 4 Realign Policies and Finance:** Redirect subsidies, promote equitable trade, and mobilize private sector investment to build resilient food systems.
  - **Action 4.1** Implement policy and institutional changes that enable transformation
  - **Action 4.2** Unlock billions in sustainable finance
  - **Action 4.3** Drive social change for more sustainable decisions
  - **Action 4.4** Transform innovation systems to deliver impacts at scale.

Open Data

01 THEME: Land cover and soil

A dataset for soil organic carbon in agricultural systems for the Southeast Asia region

Scientific Data | Source | Data |

Research team from Kansas State University work with scientists from Cambodia, Vietnam, and Laos in compiling a comprehensive dataset on Soil Organic Carbon (SOC) from Southeast Asian agricultural systems through a systematic literature review. Spanning articles published between 1987 and 2023, the dataset includes 209 studies and 4,341 observations, covering various cropping systems, management practices, soil depths, and assessment durations. This resource facilitates quantifying how land use and management practices impact SOC content, essential for developing sustainable agricultural practices and guiding regional policies on SOC sequestration. As a publicly accessible dataset, it supports efforts to enhance soil quality, mitigate climate change effects, and potentially foster carbon credit markets in the region.

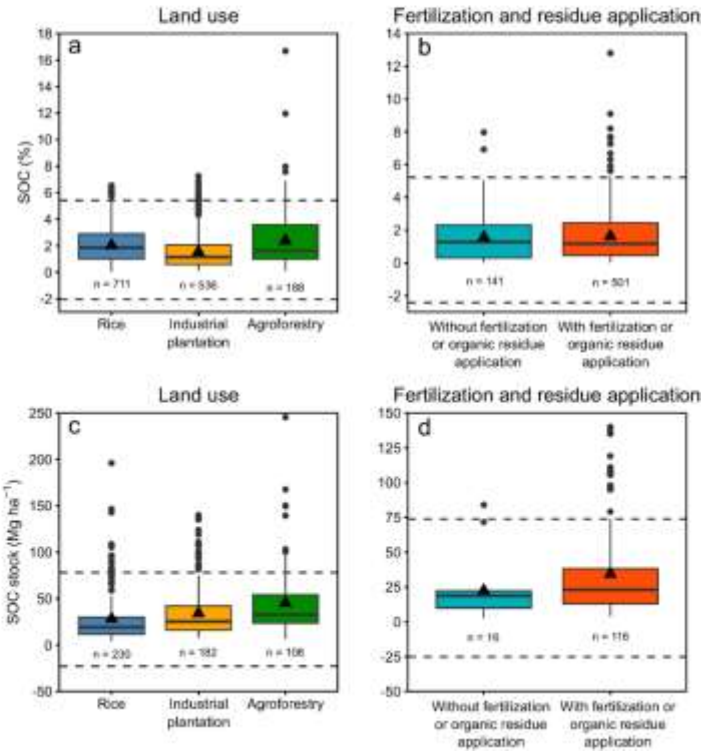


Figure | Box plot of soil organic carbon (SOC) concentration (upper panel) and SOC stock (lower panel) for the main land use (**a** and **c**), and fertilizer and organic residue application (**b** and **d**). In each main and secondary descriptor, the edges of the box correspond to the first and third quartiles (Q1 and Q3, respectively), the solid line stands for the median, the whiskers indicate the minimum and maximum value (i.e., Q1–1.5 * IQR and Q3 + 1.5 * IQR, where IQR = Q3 - Q1, the interquartile range), and the dots correspond to potential outliers. The triangles correspond to the mean SOC values for each level within treatments. The dashed horizontal lines show the lower and upper limits for mild outliers (Q1–1.5 * IQR and Q3 + 1.5 * IQR) for the treatments. 'n' indicates the number of observations in each additional descriptor.

Event

01

The 10th International Conference on Agricultural and Biological Sciences

July 29 – August 1, 2024 | In-person | Győr, Hungary | Source |

Organizer: Széchenyi István University

Overview: The ABS 2024 conference is an esteemed annual event that has successfully taken place in various locations such as Beijing, Shanghai, Qingdao, Hangzhou, and Macao, including online editions in 2020, 2021, and 2022. This year's conference will serve as a vital platform for international and interdisciplinary exchanges in the fields of Agricultural and Biological Sciences.

Main Topics

- **Animal & Plant Sciences:** Physiology, Production, Breeding, nutrition, Evolution, Horticulture, Vegtable, Weed Science. Agronomy etc.
- **Soil Sciences:** Soil Quality, Productivity, Biology, Biochemistry, Management, Pollution, Ecology, Climate Change etc.
- **Food Sciences & Agriculture Sciences**: Package, Preservation, Safety, Nutrition Organic Agriculture, Urban Agriculture, Agronomy, Rural Sociology etc.
- **Biological Sciences:** Microbiology, Biofertizers, Biodiversity, Evolution, Biological Engineering etc.

02

North Central Agriculture and Climate Conference: Connecting Research, Extension and Outreach

July 31 – August 1, 2024 | In-person | Illinois, USA | Source |

The North Central Agriculture and Climate Conference will connect research, extension, outreach, farmers, ranchers, ag advisors, and technical service providers. Focused on climate-smart agriculture, the event covers adaptation and mitigation strategies, and extension best practices for the North Central region. It includes keynote speakers, panels, and presentations, fostering peer learning and networking.

03

The 11th European Conference on Precision Livestock Farming

September 9-12, 2024 | In-person | Bologna, Italy | Source |

Since 2003, the ECPLF conference has been the premier event for the Precision Livestock Farming (PLF) community, bringing together scientists, professionals, companies, farmers, policymakers, and associations. It is the hub for cutting-edge research, innovative practices, and multidisciplinary collaboration in PLF.

Focus: The 2024 conference emphasizes the PLF-Welfare-Sustainability nexus, highlighting precision animal management's role in enhancing animal welfare, food safety, and environmental protection. The event will facilitate knowledge transfer and networking among stakeholders, showcasing how PLF can be integrated into both business operations and daily life.

PLF Overview: PLF utilizes sensors and IT to monitor animal health, welfare, and production in real-time, supporting informed decision-making for improved sustainability, disease prevention, and enhanced farm economics while promoting environmental and societal benefits.

04

The 9th International Agriculture Congress (9th IAC2024)

September 3-5, 2024 | In-person | Putrajaya, Malaysia | Source |

The 9th International Agriculture Congress 2024, organized by the Faculty of Agriculture, Universiti Putra Malaysia, aims to tackle the pressing challenges of food security and environmental sustainability as the global population is projected to reach 9 billion by 2050. The congress will feature sustainable agricultural practices and advanced farming technologies to ensure a resilient and eco-friendly food production system.

Distinguished speakers include experts like Associate Professor Dr. Sutkhet Nakasathien, Dr. Sharifah Shahrul Syed Alwee, Prof. Dr. Ir. H. James Hellyward, Giva Kuppusamy, and Dr. Feng Zhang. They will cover topics from climate adaptation and sustainable innovations to agro-edutourism and sustainable pest management.

Scope: Crop production, Livestock production, Plantation crop industry, Agricultural green technology, Aquaculture & fishery, Urban agriculture, Agricultural biotechnology, Economics, agribusiness & policy, Big data for agriculture, Agrotechnopreneurship, Landscape & recreational park, Pest management & biosecurity, Future crops, Value chain in agro-based industry, Agricultural engineering & automation, Agricultural extension & education, Herbs & medicinal plants, Sustainable soil & water management.

05

Course - Grounding Carbon Farming

September 14-20, 2024 | In-person | Normandy, France | Source |

This immersive course focuses on the role of soil carbon in climate change mitigation, adaptation, and farm sustainability. Participants will explore environmental, social, and economic implications of soil carbon sequestration, understanding perspectives from various stakeholders. The course includes farm visits, lectures, field measurements, and stakeholder debates, concluding with a policy pitch presentation to the EU commission.

Learning Goals

- Appraise the role of soils in climate change mitigation, adaptation, and farm sustainability.
- Evaluate environmental, social, and economic implications of soil carbon sequestration.
- Understand perspectives of different stakeholders on sustainability transitions.
- Critically assess soil carbon-related policies and propose alternatives.

Lecturers

- Gabriel Moinet, Alix Vidal: Soil Biology, Wageningen University
- Ina Möller: Environmental Policy, Wageningen University
- Claire Chenu: INRAE
- Roman Hüppi: myclimate NGO
- Laurent and Matthias Moinet: La ferme de Hyaumet
- Gilles Colombet-Gourdon: La ferme du domaine de Merval

Course Outline

- Day 1: Arrival and welcome dinner
- Day 2: Lectures on soils in global carbon cycles and farm tour
- Day 3: Theories and methods of monitoring soil carbon, field measurements, data analysis
- Day 4: Soil carbon and sustainability, cider factory visit, farmer interviews
- Day 5: Debate on European policies with experts, serious game
- Day 6: Final assignment - policy pitch to EU commission, goodbye dinner
- Day 7: Departure