Issue 15-2
June 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 agri-food system and climate smart agriculture, including research, news, policy, data and event updates around the world on the project website.

The production and use of synthetic fertilizers generates about 1.31 giga tons of CO_{2eq} greenhouse gases, of which about one third is associated with production (most from extraction and use of natural gas, coal and petroleum as feed and fuel in production of ammonia), the remaining two thirds is released after field application of nitrogen fertilizer. While global food security is still heavily dependent on nitrogen fertilizer, the highlight of this issues in on **decarbonizing the production, transport and distribution of nitrogen fertilizer,** as well as on **optimizing its field application**.

Content

RESEARCH

01 THEME: GHG emission reduction

Greenhouse gas emissions from nitrogen fertilizers could be reduced by up to one-fifth of current levels by 2050 with combined interventions

February 09, 2023 | Nature Food | Source |

Introduction: Researchers from University of Cambridge, UK examine the global impact of synthetic nitrogen fertilizers and manure on greenhouse gas (GHG) emissions across their entire life cycles.

Key findings: By analyzing data from 2019, the study highlights that current fertilization practices emit significant amounts of GHGs, with synthetic fertilizers alone responsible for approximately 1.31 gigatons of CO_2-equivalent emissions annually. A substantial portion of these emissions occurs during the use of fertilizers in agricultural fields, primarily due to the release of nitrous oxide (N_2O) and carbon dioxide (CO_2). Key strategies identified to mitigate these emissions include enhancing nitrogen-use efficiency in crop production and decarbonizing the production processes of fertilizers. Proposed interventions, such as using nitrification inhibitors to reduce N_2O emissions and shifting to more efficient fertilizer types, could collectively reduce global emissions by up to 84% by 2050.

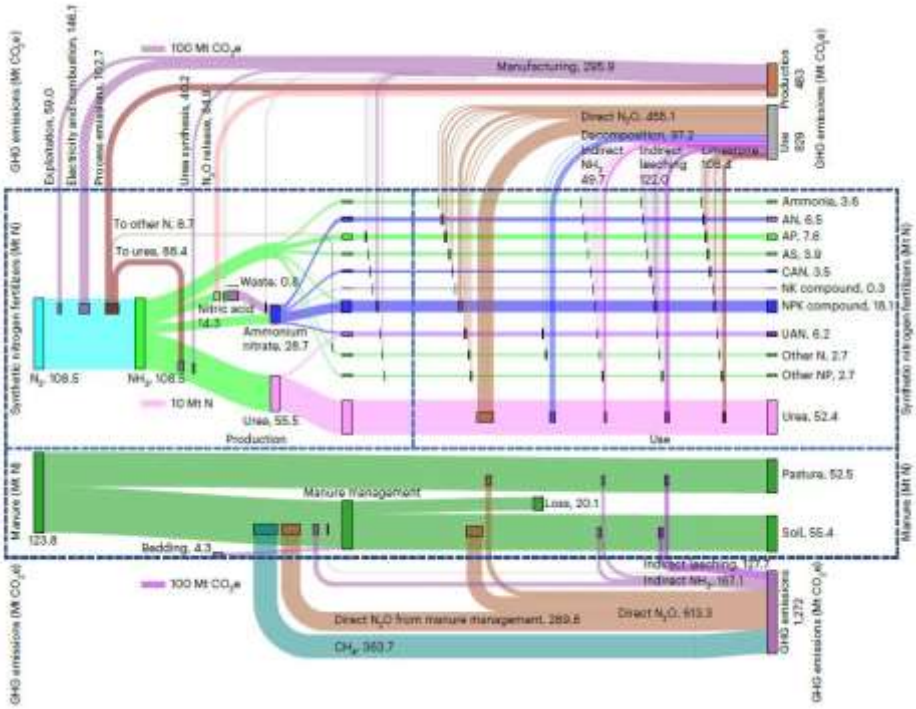


Figure | Sankey diagram of the global mass flow of synthesized nitrogen fertilizers and manure and corresponding GHG emissions in each life-cycle stage in 2019. The horizontal flows represent the mass flows of nitrogen, and the vertical flows show the points of generation of GHG along the supply chain. In both cases, the thickness of the line is proportional to the mass of nitrogen and GHG emissions, respectively. The mass of nitrogen fertilizers flows from left to right along its supply chain. AN, ammonium nitrate; AP, ammonium phosphate; AS, ammonium sulfate; CAN, calcium ammonium nitrate; NK, nitrogen potassium; NPK, nitrogen phosphorus potassium; UAN, urea ammonium nitrate; N, nitrogen; NP, nitrogen phosphorus.

02 THEME: GHG emission reduction

Fertilizer application improvements in China

May 08, 2024 | Nature Food | Source |

Introduction: Researchers affiliated with National Academy of Agriculture Green Development in China examine management practices in China aimed at improving food production efficiency while reducing nitrogen pollution by analyzing data from two national agricultural pollution censuses spanning from 2007 to 2017.

Key findings: The findings reveal that despite a slight decline in organic fertilizer use during this period, other practices such as no-till farming, reintegrating straw into fields, and improving fertilizer application methods have led to enhanced crop yields and reduced nitrogen pollution levels.

The researchers propose strategies of gradually increasing organic fertilizer use, reducing synthetic fertilizer and manure application rates, and estimated that by 2050, nitrogen use efficiency would increase by 18%. Integrating these approaches not only supports food security goals but also mitigates environmental impacts, ensuring a balance between agricultural development and ecological health in China.

03 THEME: GHG emission reduction

Spatiotemporal co-optimization of agricultural management practices towards climate-smart crop production

January 02, 2024 | Communications Earth & Environment | Source |

Introduction: Research team based in Zhejiang University in China applies advanced modeling and machine learning to optimize farming practices in China's North China Plain, balancing high crop yields with reduced greenhouse gas emissions, considering factors like nitrogen use, irrigation, and crop residue management under current and future climate conditions.

Key findings: Current farming practices, including local farmers' methods and trial-based recommendations, often exceed the optimal levels of water and fertilizer input. There is substantial potential for reducing resource inputs like fertilizer and irrigation water by 16% to 20% across the region, while also cutting greenhouse gas emissions. The optimized practices align with achieving maximum crop yields and minimizing environmental impact, crucial in a changing climate scenario. The soil organic carbon sequestration rates over time will decline yet management practices to local situations is needed to sustain agricultural productivity and mitigate climate-related risks.

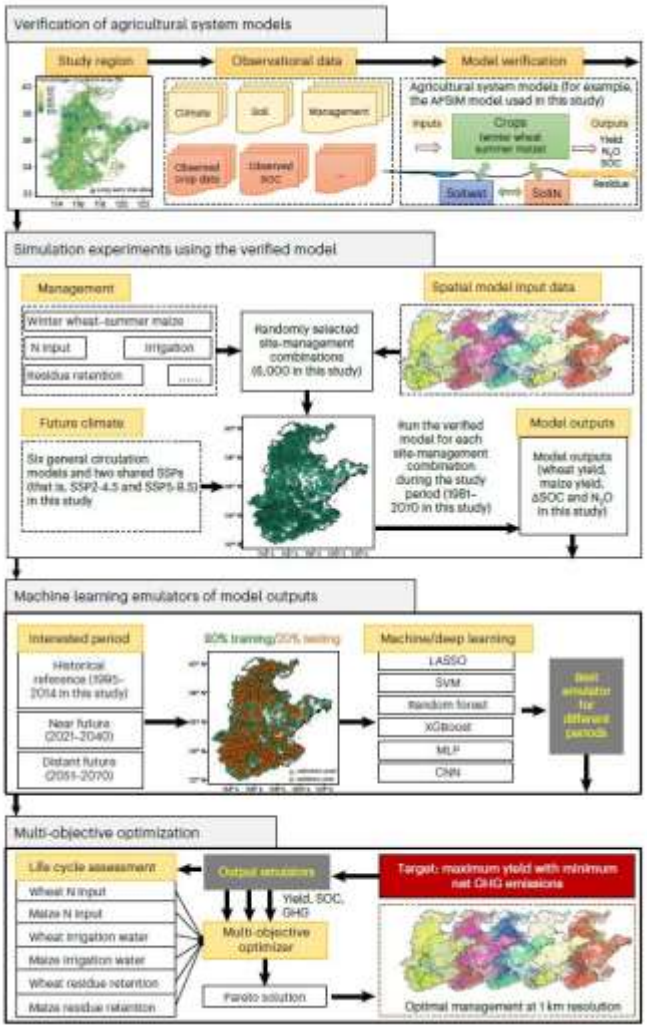


Figure | A simulation framework enables spatiotemporal optimization of multiple management practices. The framework combines verification of biophysical models, machine learning, life cycle assessment and multi-objective optimization to derive the best management combination across space and over time under targets of interests.

04 THEME: GHG emission reduction

Utilization of *Rhodopseudomonas palustris* in crop rotation practice boosts rice productivity and soil nutrient dynamics

May 13, 2024 | Agriculture | Source |

Introduction: Rice is a vital food crop, but its sustainability is threatened by excessive chemical use and monoculture practices. Crop rotation and the use of the beneficial bacterium *Rhodopseudomonas palustris* (*R. palustris*) can enhance soil health and rice yields. Researchers from National Pingtung University of Science and Technology in Taiwan explore the combined effects of crop rotation and *R. palustris* on rice growth, aiming to develop sustainable farming practices for better productivity and environmental health.

Key findings: Beneficial microorganisms like Purple Non-Sulfur Bacteria (PNSB) increased 5-aminolevulinic acid (5-ALA) levels in plants, enhancing photosynthesis. Combining PNSB with crop rotation significantly improved soil fertility, resulting in notable increases in tiller numbers (163%), leaf chlorophyll content (13%), and lodging resistance (66%) compared to untreated plants. This combined treatment also boosted productive tillers per hill (112%), average grain per hill (65%), and grain fertility (26%), leading to a 65% increase in grain yield and a 15% rise in shoot dry weight.

Additionally, PNSB treatment improved soil nutrient levels, including essential elements like phosphorus, potassium, calcium, and iron, further enhancing plant growth. Overall, the incorporation of PNSB in crop rotation strategies can significantly improve rice growth and yield, offering a sustainable approach to addressing global food security and climate change challenges.

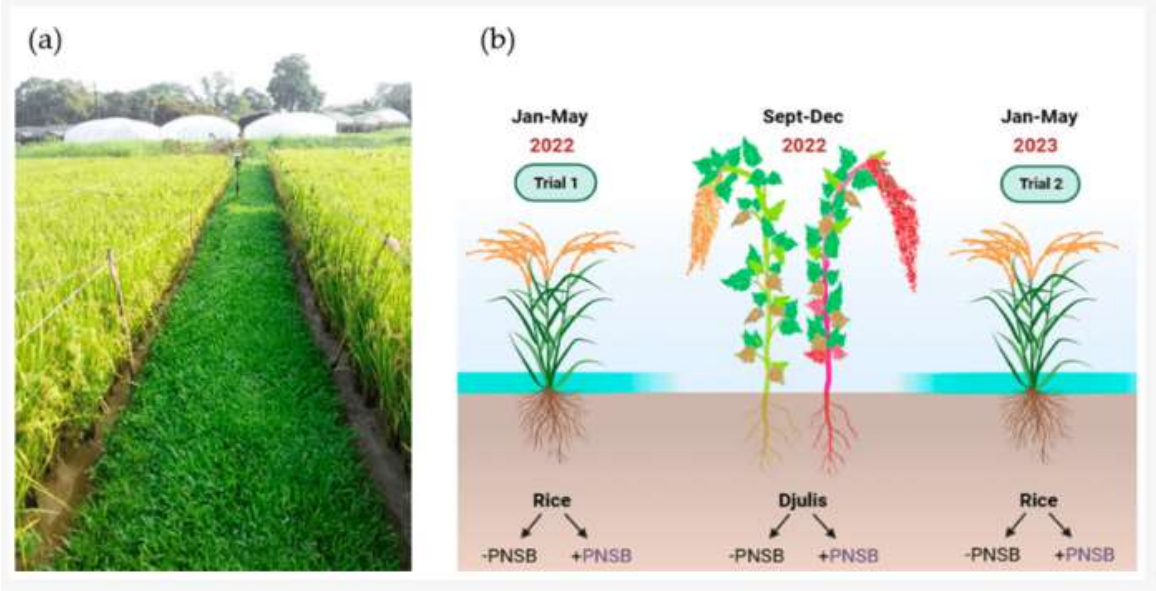


Figure | Enhancement of rice growth and yield through incorporation of purple non-sulfur bacteria (PNSB) in rice-djulis rotation practice. (a) Depiction of the rice fields utilized in this study, where djulis was cultivated as a rotational crop within the same field and (b) a schematic representation of the experimental design implemented in this study.

05 THEME: GHG emission reduction

Cost-competitive decentralized ammonia fertilizer production can increase food security

May 16, 2024 | Nature Food | Source |

Introduction: The current ammonia production is centralized in large chemical manufacturing facilities, making nitrogen fertilizer production vulnerable to high transportation costs and fossil fuel price fluctuations. Global research team led by Carnegie Institution for Science in the U.S. explores electrified ammonia production based on electric Haber–Bosch and electrocatalysis in small, decentralized production facilities within areas serviced by public power grid or powered by solar agrivoltaic systems or grid electricity.

Key findings: Decentralized production could become cost-competitive with traditional centralized methods, especially when accounting for transport costs and supply chain disruptions. By 2030, up to 96% of global ammonia demand could be met cost-effectively through decentralized production. This shift would benefit regions with food insecurity and reduce dependence on fossil fuels, cutting carbon emissions. Cost evaluation is performed by comparing decentralized production with historical ammonia market prices. Findings indicate that decentralized technologies, particularly those connected to the grid, could significantly lower fertilizer costs. Agrivoltaic systems would stabilize prices but require additional storage for continuous operation.

Decentralized ammonia production offers advantages such as reduced need for storage, lower risk of nitrogen loss during transport, and independence from fossil fuel price swings. Overall, this approach could transform the fertilizer industry, promoting sustainable agriculture and enhancing global food security.

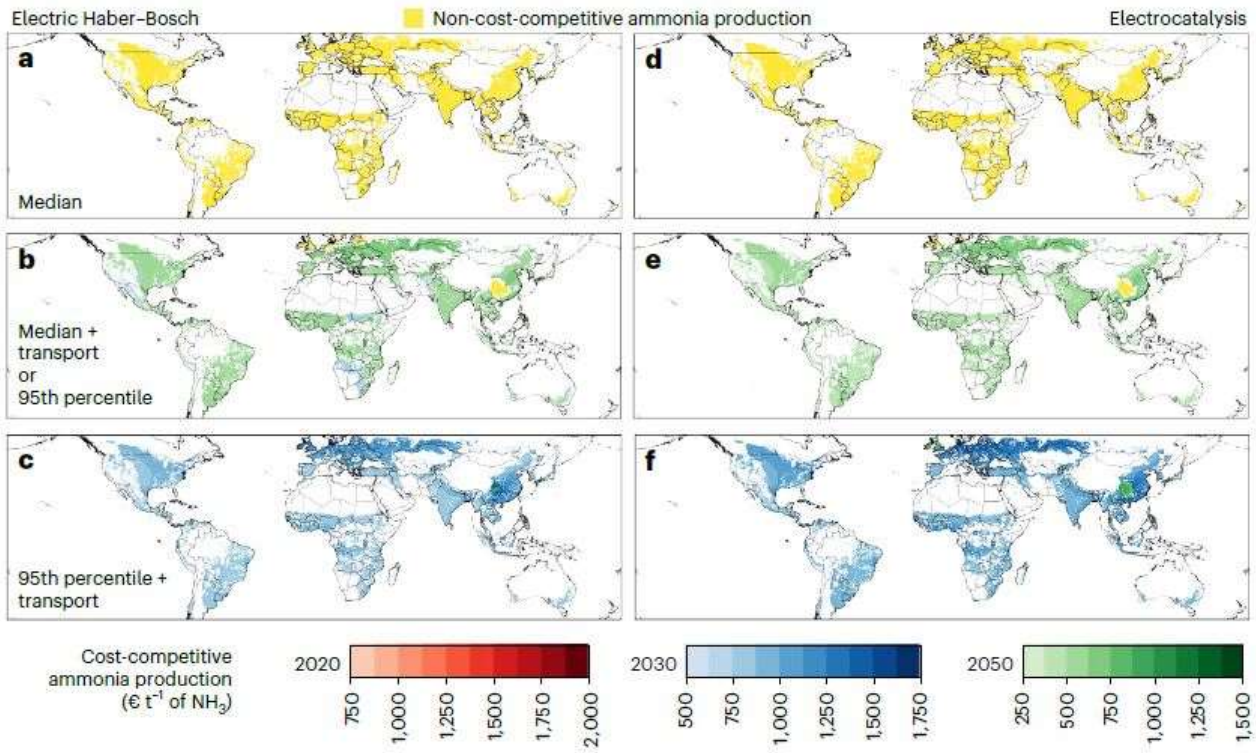


Figure | Location of ammonia demand on croplands in the current scenario supplied by either decentralized electric Haber–Bosch or decentralized electrocatalysis in the grid-connected configuration. For each pixel, the cost of ammonia production from decentralized technologies is determined based on the earliest year that achieves cost-competitiveness among 2020 (red), 2030 (blue) and 2050 (green). The cost of decentralized production is compared with the cost of ammonia production from centralized production and the cost of ammonia at the demand point, inclusive of the cost of transport. Reference costs of ammonia production from centralized production are €390 t^{-1}, €780 t^{-1} and €1,063 t^{-1} of NH_3, chosen from the median, 95th percentile, and maximum prices of the historical ammonia market price, respectively. In addition, the cost of logistics for transporting ammonia is added to the three prices, resulting in a twofold increase in the price of ammonia at the demand point. a,d, Ammonia production by decentralized electric Haber–Bosch (a) or decentralized electrocatalysisis (d) is never cost-competitive with centralized fossil-based production under low market prices from centralized production and excluding the cost of transport of ammonia. b,c, Cost-competitiveness based on electric Haber–Bosch is reached for the projected technological development in 2030 and 2050 and in comparison with the median cost of production combined with the cost of transport (equivalent to the 95th percentile cost of ammonia production) (b) and the 95th percentile cost of production with the additional cost of transport (c). e,f, Cost-competitiveness based on decentralized electrocatalysisis is reached for the projected technological development in 2030 and 2050 and in comparison with the median cost of production combined with the cost of transport (equivalent to the 95th percentile cost of ammonia production) (e) and the 95th percentile cost of production with the additional cost of transport (f). Yellow-coloured pixels represent regions where decentralized production is not cost-competitive.

06 THEME: GHG emission reduction

Global energy use and carbon emissions from irrigated agriculture

April 10, 2023 | Nature Communications | Source |

Introduction: Researchers from US and China quantify the global impact of irrigation on energy use and carbon emissions, and provide a roadmap for policymakers and agricultural stakeholders.

Key findings: Annually, irrigation activities account for 216 million metric tons of CO_2 emissions and consume 1,896 petajoules of energy worldwide. Surprisingly, despite groundwater sources serving only 40% of irrigated land, they drive a staggering 89% of total irrigation energy use due to the prevalence of energy-intensive diesel pumps. Energy consumption and CO_2 emissions can potentially reduced by 90% with more efficient and low-carbon irrigation practices, though careful consideration of regional feasibility and technological advancements is needed.

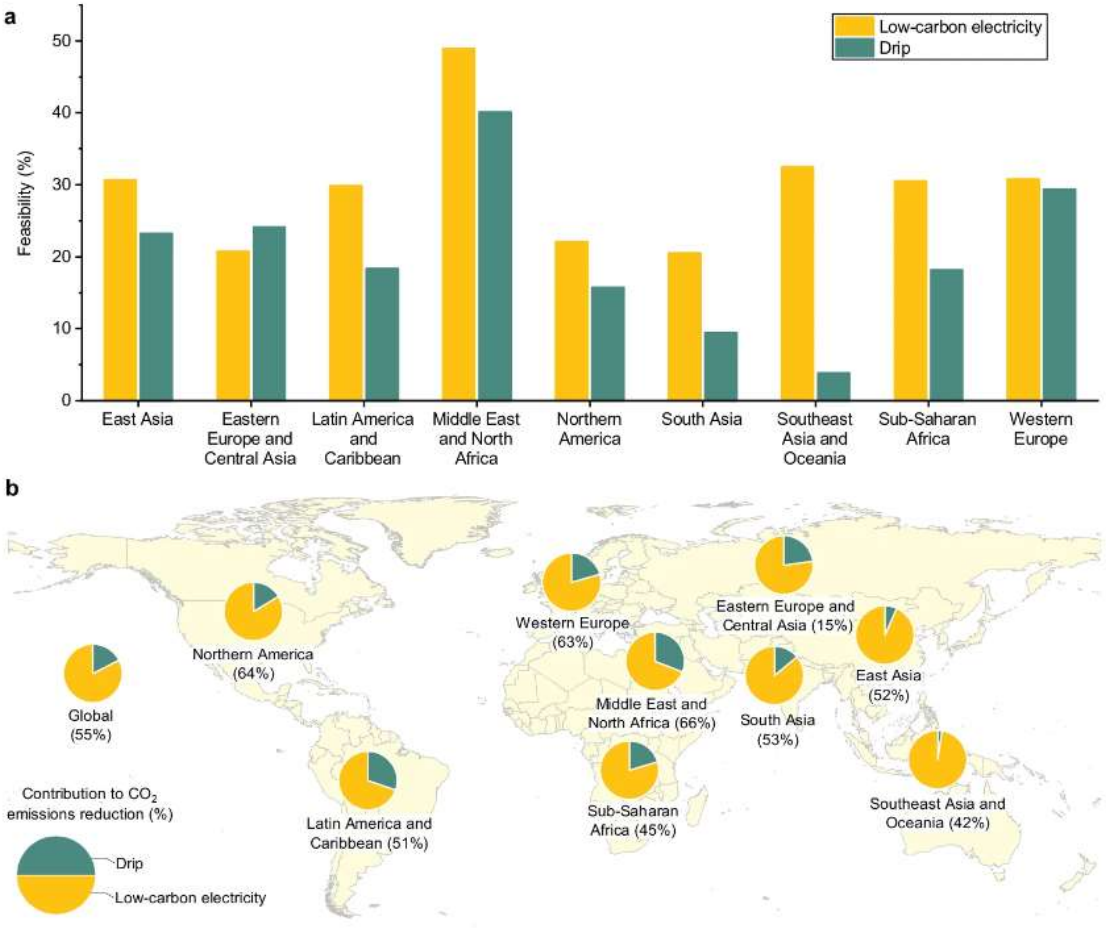


Figure | Feasibility of solutions to reduce CO_2 emissions of irrigation on a country-level scale. a Feasibility (%) of drip and low-carbon electricity. b Potential contribution (%) of drip and low-carbon electricity to energy-related CO_2 emissions reduction based on the feasibility analysis. The pie chart shows the contribution ratio of low-carbon electricity and drip to energy-related CO_2 emissions reduction. The values at the bottom of the pie chart represent the total contribution due to a combination of the two solutions. For a more detailed comparison of regional differences, we further divided the six continents into nine sub-regions (See Source Data for the rationale of the classification)

NEWS

01 **THEME:** GHG emission reduction

Yara Clean Ammonia signs historic deal with India's Greenko ZeroC to ramp up green ammonia supply

May 16, 2024 | Carbon credits |

Yara Clean Ammonia, the world's largest ammonia trader, has entered a long-term agreement with India's Greenko ZeroC, the green ammonia production arm of AM Green. This landmark deal significantly boosts the green ammonia industry and advances the net-zero goals of both nations.

The agreement secures 50% of the renewable ammonia supply from Phase 1 of AM Green's Kakinada plant in Andhra Pradesh. Greenko's facility aims to produce and export renewable ammonia using round-the-clock carbon-free energy by 2027, complying with EU renewable energy standards.

Yara Clean Ammonia will use this renewable ammonia to produce low-emission fertilizer and decarbonize industries such as shipping and power generation. AM Green's President, Mahesh Kolli, emphasized the partnership's role in transforming various industries and enhancing AM Green's leadership in the green energy transition.

Green ammonia, which emits no CO_2 upon combustion, is seen as a key future fuel, aligning well with the hydrogen economy. Despite challenges in financing and renewable power capacity, the partnership aims to establish a sustainable supply chain for low-emission ammonia, signaling a significant step toward a greener agriculture sector.

Source: https://www.yara.com/investor-relations/yca-investor-presentation/

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

Next-generation Climate Targets: A 5-Point Plan for NDCs

April 25, 2024 | World Resources Institute |

Countries are preparing to announce new climate commitments under the Paris Agreement by early 2025, termed nationally determined contributions (NDCs), crucial for global climate action. Despite past efforts, current NDCs fall short, projecting a worrying global temperature increase of 2.5-2.9 degrees C by 2100, well above the 1.5 degrees C target set by scientists to avoid catastrophic impacts.

World Sources Institute hence proposed five-point plan outlines strategies for stronger NDCs:

- Set 2035 targets and revise 2030 targets to align with net-zero and 1.5°C goals
- Accelerate transforamtion with ambitious sectoral targets
- Build resilience across all systems
- Help catalyze investements and strenghten governance
- Propmote people centered climate action

The plan emphasizes the need for countries to step up commitments, integrate sector-specific goals across energy, agriculture, and transportation, and prioritize adaptation measures to protect vulnerable communities. It underscores the role of NDCs in catalyzing global efforts to mitigate climate change's worst effects and calls for robust implementation backed by increased finance and multi-stakeholder collaboration. As nations prepare their submissions, the spotlight is on whether these strategies will catalyze the transformative action needed to secure a sustainable future.

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

Additive a big plus on effluent emissions

May 22, 2024 | Farmers Weekly (NZ) |

Lincoln University and Ravensdown have launched a collaborative project aimed at reducing methane emissions from dairy farm effluent ponds. Effluent ponds are a significant source of methane in the dairy sector. The project focuses on refining the EcoPond effluent treatment system, which uses ferric sulphate to inhibit methane-producing microbes. Early research shows potential for reducing methane emissions by over 90%. The Ministry for Primary Industries is investing $2.9 million through the Centre for Climate Action on Agricultural Emissions to support this initiative. The project will expand nationally to assess EcoPond's effectiveness across different regions and farm systems. Farmers at Lincoln University's Dairy Farm report promising results, noting cleaner ponds and reduced odors. This initiative not only targets methane reduction but also addresses freshwater contamination issues. Future steps include further testing in various seasons to assess year-round benefits, aiming to develop a practical, scalable solution for dairy farmers.

POLICY

01 THEME: Sustainable production; Circular agriculture

Policy on preventing nitrogen and phosphorus pollution

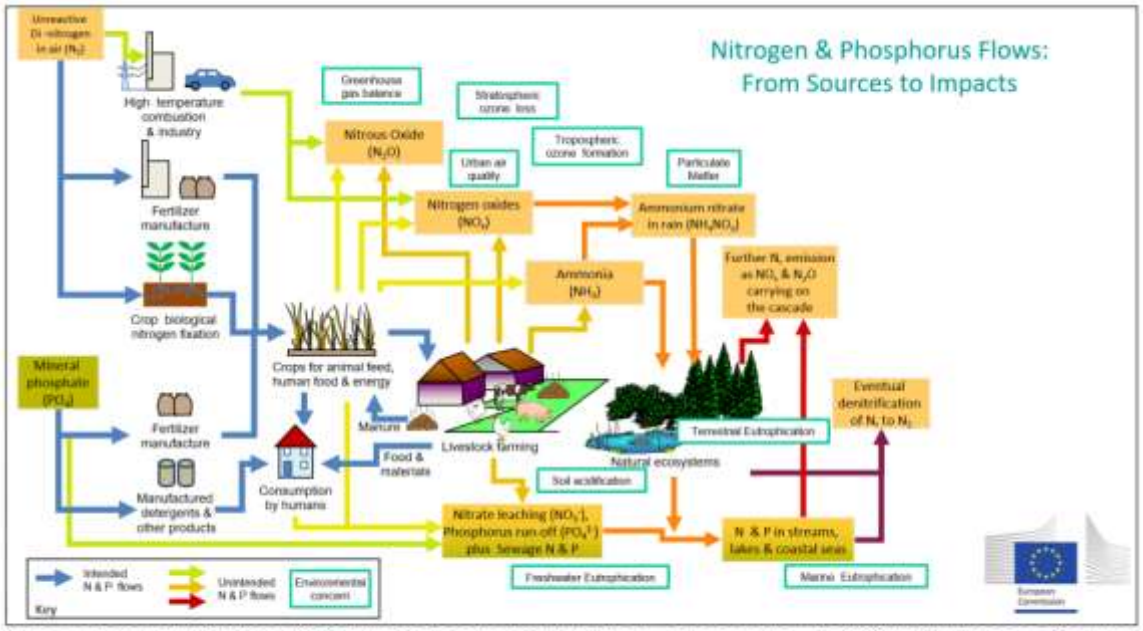
European Commission| Source | Download |

Nitrogen and phosphorus (NP) pollution poses significant environmental and health challenges across the EU, impacting water quality, soil health, and biodiversity. The European Commissions funded 72 Horizon 2020 research and innovation projects, totaling EUR 428.5 million, aimed at tackling NP pollution, and compiled the results in the report "Systemic Approach Preventing Pollution from Nitrogen and Phosphrus: A contribution to the Integrated Nutrients Management Plan from the Research & Innovation perspective."

Key Challenges: Excessive NP levels lead to eutrophication, groundwater contamination, and greenhouse gas emissions, threatening ecosystems and human health.

Project Themes: Projects are grouped into five themes: NP cycles, pollution reduction, fertilizers' production, efficient agricultural use, and governance. They focus on understanding NP flows, developing sustainable practices, and enhancing governance frameworks.

Impact and Recommendations: Most projects show environmental and technological impacts, but limited social and policy impacts. Recommendations include incentivizing circular economy practices, enhancing stakeholder engagement, and aligning with EU directives like the Green Deal and Horizon Europe missions.



Data source: Mark Sutton, UK Centre for Ecology & Hydrology - presented at the 2020 R&I days session 'How to get nutrient flows back within safe ecological limits'

02 THEME: Sustainable production and consumption

The agreement on a green transition of the agricultural sector (Denmark)

Ministry of Food, Agriculture and Fisheries of Denmark| Source | Download |

Denmark has set a global benchmark in organic farming since introducing its first organic law in 1987, pioneering organic legislation worldwide. Subsequently, in 1991, the EU followed suit with its first common European organic regulations. Danish commitment has been pivotal in achieving global leadership in organic consumption. The "Green Transition Agreement for Danish Agriculture" outlines comprehensive strategies for achieving these goals. It emphasizes public-private partnerships, continuous political support, and robust research and innovation investments.

Key Objectives

- **Expansion of Organic Areas:** The government aims to double organic farming areas to reduce pesticide use and environmental impact.
- **Consumer Demand:** Encouraging increased consumption of organic products through public awareness campaigns and incentives.
- **Export Growth:** Promoting Danish organic goods globally, leveraging the strong reputation for quality and sustainability.

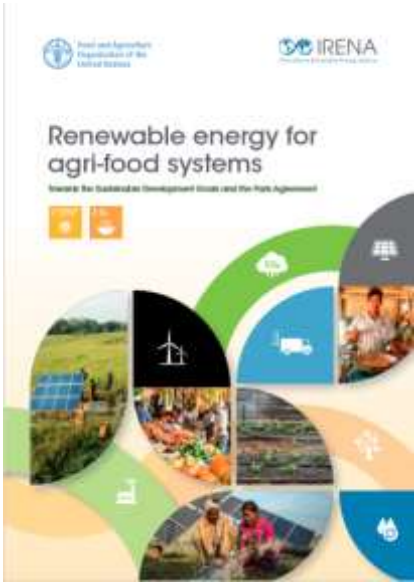
The Agreement on a Green Transition of the Agricultural Sector

- Emissions from the agricultural sector will be reduced by 55 to 65 percent.
- Restoration of peatlands to the highest possible degree in a new land reform.
- Massive investment in crucial climate technology and ambition of doubling of organic farming.
- Denmark is to be a world leader in plant-based foods and green proteins.
- The Aquatic Environment – Voluntary measures, an environmental guarantee and a second opinion.
- The EU's Common Agricultural Policy in Denmark – green transition.

03 THEME: Net-Zero

Renewable energy for agri-food systems: Towards the Sustainable Development Goals and the Paris Agreement

United Nations | Source | Download |



Global energy and food systems face increasing demands amidst environmental and societal pressures. Agri-food systems alone consume 30% of global energy and contribute significantly to greenhouse gas emissions, mainly from fossil fuel reliance.

Opportunity: Transitioning to renewable energy sources in agri-food systems offers a pathway to enhance sustainability, resilience, and inclusivity. Renewable energy can power essential stages from primary production to post-harvest processing, reducing losses and improving climate resilience.

Recommendations:

- **Data-Driven Decisions:** Enhance data availability for informed renewable energy investments in food systems. Conduct comprehensive cost-benefit analyses integrating environmental, social, economic, and gender perspectives.
- **Financial Access:** Facilitate financing mechanisms tailored to both energy supply (enterprises) and demand (agri-food end-users). Mobilize climate finance and local capital to scale renewable energy adoption.
- **Integrated Approaches:** Promote integrated food-energy systems (e.g., agri-voltaic systems) and water-energy-food nexus strategies to optimize resource use and synergy.
- **Policy Integration:** Mainstream cross-sectoral perspectives in national and regional strategies. Foster coordinated efforts among governments, private sectors, civil society, and end-users to drive systemic transformation.
- **Innovation and Implementation:** Support innovation through dedicated funds and partnerships to develop and deploy energy-efficient technologies tailored to agri-food needs.

04 THEME: Climate smart agriculture; Supply chain; Sustainable production and consumption

Securing Sustainable Food Systems: The Role of Technology and Innovation

World Farmers Organization| Source | Download |

Innovation in agriculture is essential for enhancing production quality and achieving sustainability while maintaining productivity and farm income. This encompasses products, processes, markets, and institutions, requiring technological, social, and organizational changes.

Guiding Principles

- **Redefine Farmers' Role:** Farmers are vital not only as food producers but also as stewards of natural resources, contributing to job creation and economic growth in rural areas.
- **Farmer-Centric Innovation:** Innovation must address farmers' specific needs and knowledge, adopting a bottom-up, inclusive approach that ensures accessibility and affordability for all farmers.

Policy Recommendations

- **Adopt a Solution-Oriented Vision:** Recognize agriculture as a multifunctional sector, integral to solving broader societal issues.
- **Farmer-Driven Innovation Approach:** Empower farmers' organizations and cooperatives to lead innovation efforts.
- **Increase Investment in Infrastructure:** Boost public and private investments to support technological and infrastructural advancements in agriculture.
- **Innovative Financial Models:** Develop finance and insurance models tailored to agricultural needs, ensuring financial security and risk management for farmers.
- **Consistent Policy Framework:** Create policies that facilitate and promote agricultural innovation.
- **Data Management:** Develop business models that ensure farmers benefit from data management advancements.
- **Strengthen Farmers' Role in Food Systems:** Innovate business models and technologies to enhance farmers' positions at all levels of the food system.
- **Revise Food Education Policies:** Reform nutrition and food education policies to highlight agriculture's and farmers' crucial role in providing healthy food.

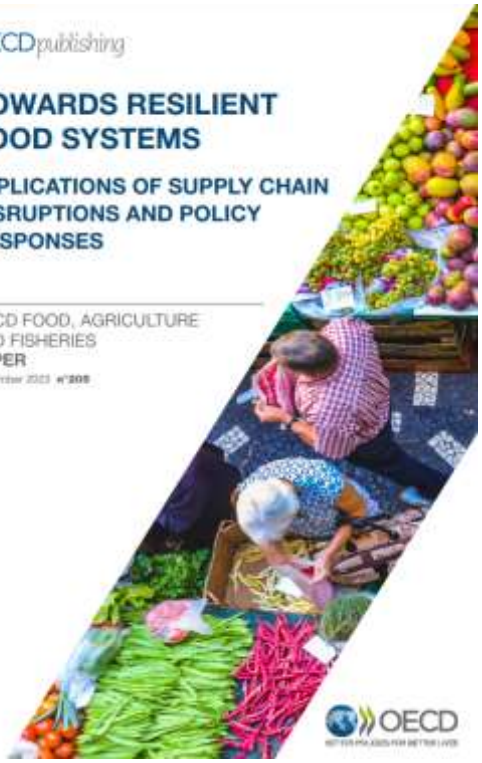
WORLD FARMERS' ORGANISATION

05 THEME: Supply chain

Towards resilient food systems: Implications of supply chain disruptions and policy responses

Organization for Economic Cooperation and Development| Source | Download |

Food supply chains face increasing threats from extreme weather, trade restrictions, and geopolitical conflicts, compounded by the impacts of climate change. The COVID-19 pandemic and the Russian war against Ukraine have heightened concerns about these vulnerabilities. Policymakers need a comprehensive understanding of food supply chains' organization and resilience to develop effective strategies.



Globalization, market concentration, and just-in-time supply chain management have increased food supply chains' efficiency but also their susceptibility to disruptions. Historically, these supply chains have managed shocks such as extreme weather, pests, and trade restrictions, often resulting in temporary price spikes but maintaining overall resilience. However, evidence on the effects of market concentration and just-in-time approaches remains inconclusive.

Policy Recommendations

- **Promote Diversification and Redundancy:** Encourage diversification in sourcing and production to reduce reliance on single suppliers or regions, enhancing overall system robustness.
- **Strengthen Social Safety Nets:** Implement and expand social safety nets and food assistance programs to ensure households' continuous access to food, addressing the root causes of food insecurity beyond supply disruptions.
- **Support Sustainable Practices:** Invest in sustainable agricultural practices that protect natural resources and reduce long-term vulnerabilities within food systems.
- **Develop Comprehensive Risk Management:** Establish frameworks for identifying and managing a wide range of potential risks, including "unknown unknowns," through participatory approaches involving diverse stakeholders.
- **Regulate Market Concentration:** Monitor and regulate market concentration to prevent excessive dependencies and enhance competitive resilience across the food supply chain.

OPEN DATA

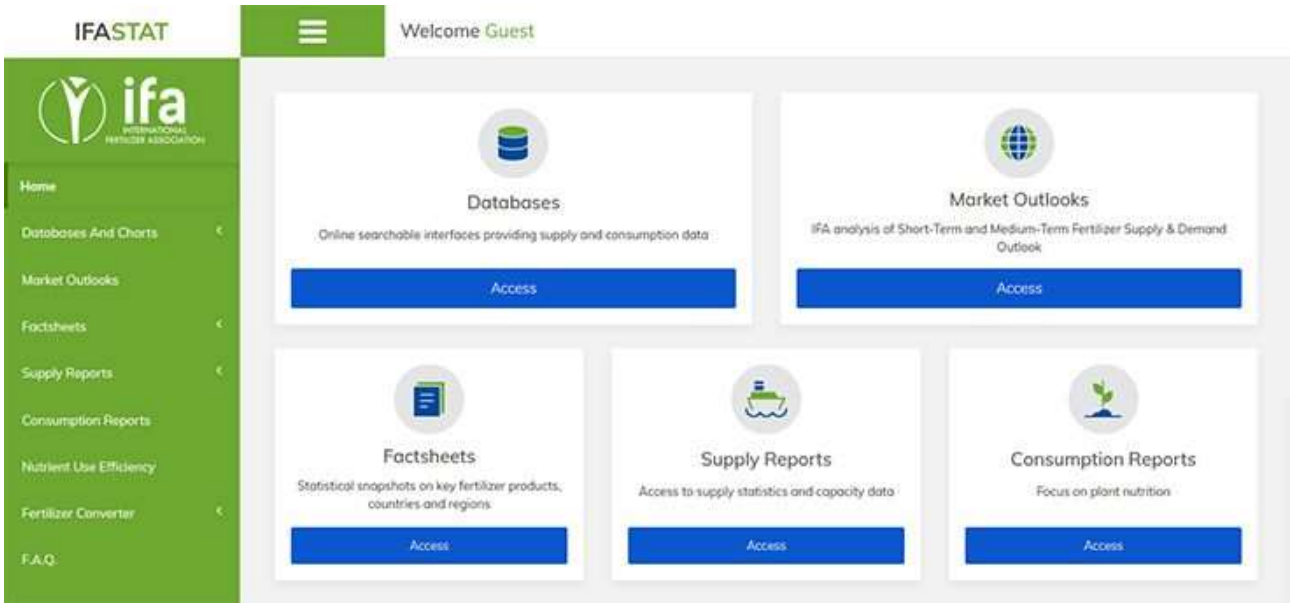
01 THEME: Agrifood system

IFASTAT: IFA's statistical information on fertilizer & raw materials

International Fertilizer Association| Source | Data |

The International Fertilizer Association (IFA), established in 1927, is a global organization dedicated to the fertilizer industry. It has about 500 members from 80 countries, including fertilizer producers, traders, distributors, research organizations, and more. IFA's mission is to promote the responsible and efficient use of plant nutrients to help feed the world sustainably.

IFA supports its members with a range of services and resources, including IFASTAT, a leading source of comprehensive statistical information on fertilizers and raw materials. This database provides valuable insights into global fertilizer supply and consumption, helping the industry make informed decisions. Through its efforts, IFA plays a crucial role in ensuring sustainable agricultural practices worldwide.



02 THEME: Agrifood system

National Fertilizer Database (Ireland)

Government of Ireland| Source |

National Fertiliser Database (NFD) is established in accordance with the Veterinary Medicinal Products, Medicated Feed, and Fertilisers Regulations Act 2023 of Ireland, signed into law on 11 July 2023. This legeslation aims to track fertiliser sales, improve water quality and environmental compliance, support Ireland's commitments to the European Commission, and simplify farmers' reporting processes.

Required by law, fertiliser producers, traders, and professional users register and submit data on fertiliser sales and use to the NFD. Ireland's commitments to the European Commission, and simplify farmers' reporting processes.

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03 THEME: Agrifood system

Fertilizer Use and Price

USDA| Source | Data |

This product offers a comprehensive view of fertilizer usage trends in the United States, spanning from 1960 to the latest available data. It covers the consumption of various nutrients and types of fertilizers, including mixed blends and micronutrients. Key insights include how much crop acreage receives fertilizers and the amounts applied per acre, specifically for major crops like corn, cotton, soybeans, and wheat.

For pricing, the product includes historical data up to 2014, with updated fertilizer price indices through 2018. The information is organized into tables, each focusing on different aspects of fertilizer use and crop-specific applications, providing valuable insights for agricultural planning and policymaking. This resource is essential for understanding agricultural productivity trends, nutrient management practices, and their implications for environmental sustainability and crop yield optimization in the United States.

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04 THEME: Agrifood system

NASA Socioeconomic Data and Applications Center - Global Agricultural Inputs

US National Aeronautics and Space Administration| Source | Data |

The Socioeconomic Data and Applications Center (SEDAC) is part of NASA's Earth Observing System Data and Information System, focusing on how human activities impact the environment. SEDAC serves as a crucial link between earth sciences and social sciences by integrating socioeconomic and environmental data.

Agriculture is a vital contributor to global environmental shifts, relying heavily on pesticides, fertilizers, and manure to sustain crop yields worldwide. Understanding the distribution and intensity of agricultural practices can enhance assessments of human and ecological exposure to potential toxins and identify areas vulnerable to environmental impacts like eutrophication, habitat loss, and species extinction. For developing sustainable agricultural practices that minimize environmental harm while supporting global food security, SEDAC hosts five datasets of global agricultural inputs:

- Global Pesticide Grids
- Phosphorus in Manure Production
- Phosphorus Fertilizer Application
- Nitrogen Fetilizer Application
- Nitrogen in Manure Production

EVENT

01

The International Conference on Agriculture and Bio-industry (ICAGRI 2024)

October 9-10, 2024 | In-person | Banda Aceh, Indonesia | Source |

Theme: Promoting Agroecology and Climate-Smart Agriculture for Environmental Resilience, Biodiversity, and Sustainability

The 6th ICAGRI 2024 aims to bring together global experts, researchers, policymakers, and students to discuss advancements, challenges, and solutions in agriculture and bio-industry. The conference will focus on promoting productivity growth, improving agricultural product quality, and maintaining environmental sustainability through the adoption of innovative technologies and practices.

Keynote speakers include Prof. Julius Van der Werf, Dr. rer. Nat. Neni Sintawardani, Prof. Dr. Elke Pawelzik, and Prof. Irwandi Jaswir. The conference will feature presentations, discussions, and networking opportunities to foster collaboration and knowledge exchange.

Important dates for abstract submission, full paper submission, and registration deadlines are specified, with the conference featuring both on-site and virtual participation options. All accepted papers will be published in Scopus-indexed proceedings.

02

5th ESP Europe Conference. Ecosystem Services: One Planet, One Health

November 18-22, 2024 | In-person | Wageningen, the Netherlands | Source |

The Ecosystem Services Partnership (ESP) is a global network connecting over 3,000 ecosystem services scientists, policymakers, and practitioners. It supports collaboration across scales and regions through working groups and national networks, aiming to enhance communication and cooperation in ecosystem services research and application. The 5th European Conference of ESP will focus on how the concept of ecosystem services can address the interconnected challenges of global health, biodiversity, and sustainability under the theme "Ecosystem Services: One Planet, One Health." The conference aims to highlight the interdependence of human, animal, plant, ecosystem, and environmental health. This aligns with international commitments under the Global Biodiversity Framework and the Sustainable Development Goals (SDGs).

Conference Objectives

- Explore how ecosystem services science can address sustainable development and global health challenges.
- Foster scientific partnerships across various domains to drive transformative change.
- Provide a platform for knowledge exchange, networking, and innovation within the ESP community.

Thematic Streams

- Ecosystem Services and Health: Focus on the relationship between ecosystem services and human, animal, and ecosystem health.
- Ecosystem Services and Transformative Change: Address the conditions needed for transformative change in ecosystem services research and application.

Special Features

- Empowering young voices by enabling high-impact participation of early career researchers.
- Pre-conference trainings, conference dinner, and field trips showcasing local landscapes.
- Opportunities for session proposals that address relevant topics for the ESP community, even if they do not fit neatly into the thematic streams.

03

1st Global Agriculture Multidisciplinary International Conference (GAMIC 2024)

November 22-23, 2024 | In-person | Hawaii, USA | Source |

The College of Agriculture Forestry and Natural Resources (CAFNRM) at the University of Hawaii at Hilo proudly organizes the inaugural Global Agriculture Multidisciplinary International Conference (GAMIC) in 2024. This conference serves as a platform to highlight the critical importance of global agriculture amidst contemporary challenges. GAMIC aims to explore innovative research and practical solutions in diverse fields such as crop production, plant protection, sustainability, economic viability, education, and postharvest handling and technology.

Objectives

- Discuss current studies and findings on global agriculture.
- Foster collaboration among scholars, researchers, and practitioners in the agricultural sciences.

Topics

- Sustainable Agriculture
- Bioeconomy
- Sustainable Agrotourism
- Globalization and Agriculture
- Languages in Agriculture and Forestry
- Teaching and Agriculture
- Human Resources and Agriculture
- Climate Change and Agriculture
- Culture and Agriculture
- Agroecology
- Precision Agriculture
- Agribusiness
- Sustainable Food Systems
- Indigenous Knowledge Systems
- Biotechnology
- Aquaculture
- Microplastics