

From Ambition to Implementation: Scaling Climate-Resilient and Sustainable Agri-Food Systems through NDCs and NAPs

Submission by the International Agri-Food Network (IAFN) to the Belém Mission to 1.5

The International Agri-Food Network (IAFN) brings together international, regional, and national associations, and organizations across the agri-food value chain, translating global policy into practical implementation, and bringing real-world operational expertise and data into multilateral processes.

International cooperation should focus on making climate-resilient and sustainable agri-food systems the most attractive and economically viable option across the value chain. Success will depend not only on greater ambition, but on creating the policy certainty, financial incentives, innovation ecosystems and international partnerships that enable all actors in the value chain to implement climate solutions at scale. This means moving from pledges to implementation, from pilot projects to deployment, and from fragmented interventions to coordinated action across the entire value chain.

Countries should translate these priorities into sector-specific and investable measures under their nationally determined contributions (NDCs) and national adaptation plans (NAPs), supported by clear institutional responsibilities, measurable milestones, financing strategies and mechanisms for engaging relevant agri-food value chain actors and other stakeholders, in accordance with national circumstances.

Sustainable productivity growth, accompanied by improved resource efficiency and safeguards against adverse environmental and social impacts, is an important enabler of food security, climate resilience and positive outcomes for nature. Sustainable yield growth is particularly important because land and natural resources are finite.

Sustainable growth in agricultural output, combined with reductions in food loss and waste, improved processing efficiency and circular use of resources, is essential to meet growing demand while operating within planetary boundaries

Climate resilience is an urgent priority for farmers and businesses as extreme weather, water stress, shifting pest and disease pressures, infrastructure disruption and production volatility increasingly affect livelihoods, food supply and investment.

A major constraint is not lack of ambition, but the absence of effective implementation mechanisms. Scaling solutions requires finance, incentives and risk-sharing mechanisms that reach all value-chain actors, particularly farmers and small and medium-sized enterprises that are critical to food system transformation.

In many contexts, agri-food actors faces limited access to appropriate designed climate-finance instruments, transition incentives and risk-sharing mechanisms, despite the sector's importance for adaptation, mitigation, livelihoods and food security.

Private investment follows policy certainty. Stable, science-based and predictable regulatory frameworks are essential to unlock long-term investment, accelerate innovation and enable new technologies and solutions to reach the market.

Regenerative, climate-smart and circular solutions scale when they deliver economic value, reduce risk and are supported by technical assistance and trusted local partners.

Fragmented measurement, reporting and verification systems remain a significant barrier to finance and scaling.

1. What action areas and solutions have the highest impact potential?

The highest-impact contribution to NDCs and NAPs is accelerating the transition to climate-resilient, productive and sustainable agri-food systems across the entire value chain.

Sustainable productivity growth need not compete with climate objectives. When combined with efficient resource use, reduced loss and waste, protection of natural ecosystems and improved resilience, it can help advance food security, mitigation, adaptation and nature objectives together.

Sustainable growth must come not only from increasing agricultural output on existing farmland, but also from reducing food loss and waste, improving manufacturing and logistics efficiency and advancing circularity throughout the value chain.

Land-use change remains one of the largest sources of emissions for the sector and should be limited as much as possible, while strengthening the capacity of the entire agri-food value chain to adapt to climate impacts and meet the needs of a growing global population.

The selection and design of climate actions should also consider their effects on food availability, affordability, nutrition, farmer livelihoods and employment. Measures should avoid shifting costs disproportionately onto farmers, small businesses or consumers, particularly in food-import-dependent and climate-vulnerable countries.

There is no single technological or production pathway applicable to all countries. Implementation should be nationally led, reflect different production systems and stages of development, and build on local knowledge, institutional capacity and the needs of farmers and value-chain actors.

Depending on national circumstances, high-impact solution portfolios should prioritize measures that can deliver demonstrable adaptation, mitigation, productivity and livelihood benefits, are economically viable for intended users and can be deployed at scale. Priority solutions could include:

Resilient production and natural-resource efficiency

- Improved seeds, breeding technologies and climate-resilient crop varieties.
- Digital agriculture, precision farming and AI-enabled decision support.

- Integrated pest management, supported where appropriate by safe, effective and responsibly managed crop-protection tools.
- Biologicals and other innovations that complement existing production systems.
- Improved nutrient-use efficiency and fertilizer optimization.
- Locally adapted regenerative and climate-smart agricultural practices.
- Climate-risk assessment, early-warning services, anticipatory action, climate information and risk-management tools, including insurance and other context-appropriate risk-sharing mechanisms.

Livestock health and emissions efficiency

- Improved animal genetics and feed efficiency, including feed additives that reduce enteric emissions.
- Enhanced animal health and husbandry through preventive care, good farming practices, improved biosecurity, vaccines, diagnostics, appropriate nutrition and digital monitoring systems that reduce disease pressure, losses and emissions intensity.

Low-emission processing, logistics and circularity

- Energy-efficient and low-emission food-processing technologies that reduce operational footprints while improving productivity, competitiveness and resource efficiency.
- Sustainable packaging and circular-economy solutions that reduce food loss and waste, improve resource efficiency and support resilient food systems.
- Climate-resilient storage, cold-chain, transportation, energy and processing infrastructure that reduces food loss, improves market access and strengthens continuity of supply.

Enabling data, finance and partnerships

- Proportionate, interoperable and credible measurement, reporting, verification and learning systems that build on existing data, avoid unnecessary reporting burdens and support continuous improvement.
- Public-private partnerships, blended-finance mechanisms and market-based incentives that accelerate the deployment of proven solutions from farm to consumer.

Technology choices should be science- and evidence-based, adapted to local conditions, subject to applicable regulatory and risk-assessment frameworks, and accompanied where necessary by stewardship, training, data-governance and monitoring arrangements.

Finance, technology and capacity-building opportunities

A central opportunity is closing the gap between climate ambition and implementation across the agri-food value chain.

While food systems are expected to contribute significantly to climate mitigation, adaptation and resilience, many actors—including farmers, cooperatives, processors and small and medium-sized enterprises—often lack access to the incentives, risk-sharing mechanisms and investment support available in other sectors.

Climate finance should therefore prioritize the practical deployment of technologies and practices that improve resilience, increase productivity and reduce emissions simultaneously. Greater emphasis should be placed on de-risking investment, supporting technology adoption, strengthening local innovation ecosystems and enabling access to affordable finance for value-chain actors of all sizes.

Finance and capacity-building arrangements should be designed to reach small-scale producers, women and young entrepreneurs, cooperatives, Indigenous Peoples and local communities, and SMEs, where relevant to national circumstances, while enabling participation by businesses of all sizes.

Priority actions include:

- Expanding blended finance and public-private risk-sharing mechanisms that mobilize investment across the agri-food value chain, from production and processing to storage, logistics and distribution.
- Scaling adaptation finance and strengthening access to affordable capital for farmers, cooperatives, food manufacturers and in particular SMEs.
- Supporting transition costs through grants, concessional finance, targeted incentives and de-risking instruments that accelerate the adoption of climate-smart, resource-efficient and resilient technologies and practices.
- Supporting project preparation, aggregation mechanisms and investable pipelines that connect national NDC and NAP priorities with financeable projects and enterprises.
- Investing in extension services, technical assistance and workforce skills and knowledge-transfer programs that enable effective implementation and technology uptake throughout the value chain.
- Strengthening local innovation ecosystems by supporting research, technology development, demonstration projects and pathways to commercial scale.
- Creating public, blended and market-based mechanisms, as appropriate, that recognize and reward measurable climate, resilience and environmental outcomes, while generating value for farmers and other value-chain actors.
- Accelerating the deployment of climate-resilient infrastructure, including storage, cold-chain, transportation and processing capacity that reduces food loss, improves market access and strengthens food system resilience.
- Supporting interoperable MRV systems that unlock investment and reduce transaction costs.

Most significant barriers

The most significant barriers are:

- Policy instability, regulatory uncertainty and barriers that unnecessarily delay innovation access to market.
- Insufficient financial incentives , de-risking instruments and blended finance mechanisms to support the transition to more resilient, productive and lower-emission food systems.
- High transaction costs, limited project-preparation capacity, small and dispersed investment sizes, insufficient local-currency finance, short loan tenors and risk perceptions that do not adequately reflect the performance of agri-food investments.
- Limited mechanisms to recognize and reward verified resilience, emissions-reduction and other environmental outcomes, including through public incentives, results-based finance, procurement approaches and appropriate market mechanisms. This reduces incentives for farmers, processors and other value-chain actors to invest in climate solutions.
- Fragmented MRV requirements and sustainability standards.
- Limited access to innovation, technology transfer and capacity-building, particularly for farmers, SMEs and actors in the processing, storage and distribution segments of the value chain.

Farmers and other agri-food value-chain actors are being asked to deliver climate, adaptation and nature outcomes without a clear economic return on those investments. Long-term transformation will only scale when sustainability and resilience are aligned with commercial value and competitiveness.

Climate strategies must therefore create tangible business cases for action by rewarding measurable outcomes, reducing transition risks and improving productivity, profitability and market opportunities.

Public support and private investment should be directed towards solutions with credible evidence of impact, clear additionality and transparent monitoring. Implementation frameworks should assess results across mitigation, adaptation, food security, livelihoods and environmental performance, and allow policies and programmes to be adjusted in light of evidence.

2. What is required to strengthen international cooperation?

International cooperation should move beyond target-setting and focus on implementation.

First, countries should collaborate to create the policy and regulatory consistency needed to accelerate the deployment of proven agri-food technologies and innovations, including improved seeds, digital agriculture, biologicals, crop protection technologies, nutrient management tools and climate-resilient farming systems and innovations across the processing, storage and distribution segments of the value chain.

Policy cooperation should promote transparent, science-based and predictable regulatory approaches, facilitate trade in accordance with international rules, and reduce unnecessary regulatory fragmentation that delays access to beneficial innovations and climate solutions.

Second, international cooperation should focus on mobilizing and aligning finance. Greater collaboration between development banks, climate funds, governments and the private sector is needed to create investable pipelines and reduce the risks associated with agri-food systems transformation.

The priority is not only increasing climate finance volumes but ensuring that finance reaches actors across the agri-food value chain and supports implementation on the ground.

International financial institutions, climate funds and governments should work together to strengthen project preparation, develop aggregation mechanisms, expand local-currency and longer-term finance, and align investment criteria with nationally identified NDC and NAP priorities.

Third, countries should work towards greater alignment of methodologies, metrics and reporting frameworks relevant to food and agriculture sector. Fragmented standards increase costs, reduce transparency and slow investment.

Greater interoperability, transparency and comparability among methodologies for measuring resilience, emissions reductions and nature-related outcomes would reduce transaction costs and help scale public and private investment, while allowing approaches to reflect national circumstances and sector-specific needs.

Cooperation should support open and interoperable data systems and greater compatibility among methodologies for measurement, monitoring, reporting, verification and learning.

International cooperation should also strengthen knowledge exchange and capacity building among countries, research institutions, farmer organizations and value-chain actors, including through practical demonstration, peer learning and partnerships that adapt proven solutions to local conditions.

The Belém Mission to 1.5 should therefore encourage countries and partners to develop nationally owned agri-food implementation packages linked to NDCs and NAPs. These packages should combine prioritized policy reforms, investable project pipelines, appropriate technologies and practices, capacity building, interoperable measurement systems and public-private financing arrangements, with clear responsibilities and milestones for delivery.