

Submission to the Belém Mission to 1.5: Accelerating Implementation of National Adaptation Plans through Climate-Resilient Agrifood Systems

Summary

Accelerating the implementation of National Adaptation Plans (NAPs) requires placing smallholder farmers at the centre of adaptation strategies. Smallholders remain among the most vulnerable to climate shocks, conflict-related disruptions, market volatility, and resource scarcity, yet they are also among the most effective agents of adaptation. Strengthening their resilience delivers multiple benefits: enhanced food security, poverty reduction, economic stability, and climate resilience.

The COP29, COP30 and COP31 Presidencies should prioritize adaptation investments that expand access to climate risk intelligence, climate-smart agricultural technologies, extension services, and inclusive finance mechanisms. Particular attention should be given to youth, women, and vulnerable farming communities who are critical actors in transforming agrifood systems.

High-Impact Action Area: Climate-Resilient Agrifood Systems

Global conflicts, climate extremes, and economic instability are increasingly disrupting food production and supply chains. Smallholder farmers in Sub-Saharan Africa and other climate-vulnerable regions face compounding risks from droughts, floods, pests, land degradation, and market disruptions. These pressures threaten progress toward both adaptation and development goals.

Experience from community-based adaptation initiatives demonstrates that resilience is strongest when farmers have access to timely climate information, appropriate technologies, local capacity-building, and affordable finance. In Turkana, Kenya, agricultural officers working with refugee and host communities have supported the adoption of climate-sensitive innovations including zai pits, drip irrigation systems, and cone gardens, enabling continued household food production under increasingly challenging climatic conditions. Similar locally-led initiatives across Africa demonstrate that practical adaptation solutions already exist and can be scaled through NAP implementation and supporting locally-led efforts.

Leveraging Agritech and Climate Risk Intelligence

Climate risk intelligence platforms, digital advisory services, weather forecasting tools, and remote sensing technologies can significantly improve farmers' ability to anticipate, prepare for, and respond to climate shocks.

In Kenya, DroughtSmart Solutions has developed the DS Farmer App, which combines on-ground observations, satellite imagery, analytics, and AI to provide farmers with information on rainfall patterns, soil temperature, soil moisture levels, crop suitability, and pest and disease risks. Information is provided freely through both a mobile application and a dedicated WhatsApp channel, enabling farmers in drought-prone regions to make more informed production decisions.

Similarly, FarmAsyst Limited in Ghana has developed a web and mobile application that tracks farm activities in real time, improving monitoring, productivity, and sustainable food production while supporting access to input financing for smallholder farmers.

These examples demonstrate how climate risk intelligence can support farmer decision-making, improve preparedness, and strengthen adaptation at community level. However, technology adoption remains constrained by limited access, affordability challenges, weak extension systems, and insufficient investment in last-mile delivery. NAP implementation should therefore prioritise both innovation development and deployment and accessibility at the community level to maximise impact of these innovations in supporting adaptation measures.

Priority 1: Scale and Rebalance Climate Finance Toward Adaptation for Smallholder Farmers

Climate finance remains heavily skewed toward mitigation despite the urgent need for adaptation investments. Adaptation currently represents only a small share of global climate finance, while agrifood systems receive only a fraction of adaptation funding despite accounting for more than half of adaptation needs. Adaptation only accounts for around 10% of global climate finance¹ and will be 12 times below what is needed in developing countries by 2035². Specifically, regarding agrifood systems, they only receive 20% of adaptation funds, (ca. 1% of total climate finance)³, despite accounting for over half of adaptation needs. This exemplifies a growth area, necessitating the urgency to scale up finance in this area to tackle hunger and boost food production. A rapid increase and reallocation of public finance toward smallholders will catalyze agrifood system transformation through expanding extension services which will ease access to innovations that support agricultural adaptations for climate change, making smallholders and their communities fit for the new realities.

To accelerate NAP implementation, governments and financial institutions should:

- Increase public and blended finance dedicated to agricultural adaptation;
- Establish dedicated financing windows for smallholder farmers and rural communities;
- Expand locally led adaptation funding mechanisms;
- Integrate adaptation investments into national agricultural development strategies;
- Strengthen financial instruments that reduce risks associated with climate-smart agriculture investments.

¹ <https://www.climatepolicyinitiative.org/wp-content/uploads/2024/10/Global-Landscape-of-Climate-Finance-2024.pdf>

² <https://www.unep.org/resources/adaptation-gap-report-2025>

³ https://www.fao.org/newsroom/detail/cop30--landmark-report-finds-countries--climate-agrifood-ambitions-undermined-by-funding-gaps/en?utm_source=chatgpt.com

Practical examples already demonstrate the value of targeted adaptation finance. AgSave in Zambia is improving access to finance for farmers through fintech solutions, while Carbon Forest Zambia supports smallholder farmers through climate finance-linked cashew production, sustainable agricultural land management, extension services, and partnerships with financial institutions. These initiatives demonstrate how innovative financing mechanisms can support both resilience and livelihood diversification to help those in food systems adapt to a changing climate.

Another important example is Ecoimpact Limited in Ghana, which works with 1,200 smallholder farmers by combining climate-smart agriculture training with financial literacy, record-keeping support, and grants for essential adaptation resources, thereby addressing the lack of formal financial records that often prevents smallholders from accessing finance. Similarly, Farmslate, active in Nigeria, combines real-time geospatial farm data with local validation and climate-resilience training to support agroecological practices while generating farm records and risk profiles that help financial institutions assess creditworthiness and expand access to finance for smallholder farmers.

Priority 2: Invest in Agricultural Innovation, Research, and Last-Mile Delivery

Research and innovation have consistently delivered strong returns for both farmers and investors. Investments in climate-resilient crop varieties, precision agriculture technologies, climate risk intelligence platforms, advanced irrigation systems, and nature-based solutions are critical for strengthening the resilience of agrifood systems in times of climate change. Increasing investment in climate adaptation technologies and practices not only benefits smallholder farmers but also supports underrepresented communities and ecosystems. These investments generate multiple gains, including improved economic outcomes, enhanced resilience to climate shocks, and mitigation co-benefits. Investing \$1 in CGIAR agricultural research and development has seen investors gaining \$10 worth of benefits related to smallholder farmer communities and the environment, as well as helping bring about crop varieties and solutions that can be used in both the Global North and South.

Examples from across Africa demonstrate the potential of adaptation-focused innovation. In Nigeria, Smartel is deploying IoT-powered hydroponic systems that significantly reduce water use while increasing productivity and providing real-time pest and disease monitoring. Green Eden Farms is using AI- and IoT-enabled farm management systems to provide environmental data that supports climate-smart decision-making among smallholder farmers.

At the community level, Enocka Odongo's Community Climate Smart Agricultural Center in Kenya provides practical training on raised beds, vertical gardening, biochar, agroforestry, water conservation, and vermiculture. In Zambia, the Accelerate Water and Agricultural Resource Efficiency (AWARE) project works with 11,000 smallholder farmers through demonstration sites focused on water harvesting, water-use efficiency, and climate-resilient agricultural practices.

Innovation alone is not sufficient if farmers cannot access or effectively use these solutions. NAP implementation should therefore prioritise:

- Increased investment in agricultural research and development;
- Scaling climate-smart technologies adapted to local contexts;
- Expansion of agricultural extension services;
- Farmer training and digital literacy programmes;
- Public-private partnerships that bridge the gap between innovation and implementation.

The combination of investing in innovations and implementing measures to bridge the “lab-to-farm” gap at scale will increase food systems’ resilience. Through the development and widespread implementation of technologies and crop-varieties that are designed to deal with the climate crisis, communities will be significantly boosted in their ability to adapt to climate change.

Priority 3: Empower Youth, Women, and Vulnerable Groups as Adaptation Leaders

Transforming agrifood systems to support climate change adaptation will not be possible without empowering those who are both most affected and most capable of driving change, young people and women associated with smallholder farming.

Numerous initiatives demonstrate the effectiveness of youth- and women-led adaptation. The Women Economic Empowerment through Climate Smart Agriculture initiative in Kenya supports pastoralist communities through climate-adaptive crops, dairy goat farming, poultry production, and fruit tree distribution. In Ghana, agricultural engineer Gifty Opoku has supported more than 500 women farmers through climate-resilient mechanization services, training, and financing support.

Youth-led innovation is also driving adaptation. Soupah Farm-en-Market in Nigeria supports rural farmers through climate-resilient inputs, solar-powered irrigation systems, agronomic support, and direct market connections, while simultaneously training thousands of youth and farmers on climate-smart agriculture.

Climate finance should therefore:

- Improve access to finance for youth- and women-led agricultural enterprises;
- Support climate-smart agricultural MSMEs and agribusinesses;
- Expand leadership, technical training, and entrepreneurship programmes;
- Institutionalise youth participation mechanisms within NAP development and implementation processes;
- Promote co-design approaches that position local communities as decision-makers rather than beneficiaries.

Nature-Based and Community-Led Adaptation

Many of the most effective adaptation solutions combine traditional knowledge with innovation and ecosystem restoration.

Examples include biochar production from agricultural waste in Ghana to improve soil fertility and water retention; agroecology and urban farming initiatives in Kenya that transform underutilized urban spaces into productive food systems; and community-led agroforestry, conservation agriculture, and farmer-managed natural regeneration projects across multiple African countries.

These initiatives deliver adaptation, livelihood, and environmental benefits simultaneously while strengthening local ownership of climate action.

Key Barriers to Implementation

Several barriers continue to limit effective adaptation action in agrifood systems:

- Insufficient adaptation finance reaching local communities;
- Limited access to climate risk intelligence and digital technologies;
- Weak agricultural extension systems;
- Inadequate investment in last-mile delivery mechanisms;
- Fragmented policy frameworks across climate, food, and development sectors;
- Limited participation of youth, women, and vulnerable groups in decision-making processes;
- Limited access to land, finance, and productive resources for young farmers;
- Heightened vulnerability resulting from conflict and geopolitical instability.

Strengthening International Cooperation

The Belém Mission to 1.5 provides an important opportunity to strengthen international cooperation around resilient food systems.

Priority areas for cooperation include:

- Scaling climate risk intelligence and early warning systems across vulnerable regions;
- Expanding South-South and triangular cooperation on climate-smart agriculture;
- Mobilising blended finance mechanisms for agricultural adaptation;
- Supporting knowledge exchange between research institutions, governments, and farming communities;
- Enhancing collaboration between climate, food, nature, and development agendas;
- Promoting inclusive governance mechanisms that elevate youth and smallholder voices in adaptation planning.

Conclusion

Accelerating implementation of National Adaptation Plans requires a fundamental shift toward locally led, farmer-centred adaptation strategies. Experiences from across Africa demonstrate that investments in climate risk intelligence, agritech innovation, extension services, climate finance, and youth leadership are already delivering measurable resilience benefits at community level.

Smallholder farmers are not only among those most vulnerable to climate change; they are also among the most effective agents of adaptation. Placing them at the centre of climate finance and adaptation planning is one of the fastest and most impactful pathways to achieving the goals of the Belém Mission to 1.5.