

21 Climate smart agriculture and food systems that reduce poverty and hunger

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Poor communities that rely on functioning food systems for their livelihoods are highly vulnerable to the devastating effects of climate change while agri-food systems are significant emitters of greenhouse gases. This chapter reviews opportunities to scale up innovative technology and practices to transform food systems and to leverage climate action to reduce poverty, hunger and malnutrition in line with the complementary Sustainable Development Goals. Drawing on country experiences – India, Tajikistan, Lao People’s Democratic Republic and Myanmar – with integrated strategies, it looks at how climate strategies such as nationally determined contributions can be aligned with national agricultural and anti-poverty strategies; the need for multisector and multistakeholder action and participation; challenges to joint financing for climate action, poverty and hunger goals; and adapting government and donor systems to co-ordinate implementation.

Key Messages

- In 2022, 2.4 billion people lacked regular access to adequate food. The devastating impacts of climate change on food systems could push the goals of ending hunger, malnutrition and poverty further out of reach.
- Transforming food systems is central to achieving net zero goals because they are responsible for nearly 30% of global greenhouse gas (GHG) emissions. Innovative and proven agri-food technologies and practices can lower emissions, increase yields and build resilience and they should be scaled up.
- Aligned, integrated and co-ordinated climate, poverty, hunger and malnutrition policies, actions and finance can best support particularly vulnerable poor communities that rely on functioning food systems for their livelihoods.
- Development partners should use multistakeholder platforms at the country level to co-ordinate climate commitments, action plans and investments, as this can ensure limited resources for development co-operation are leveraged and multiple development outcomes enhanced.

Failing food systems, climate change and poverty: Breaking the vicious cycles

Despite some recent progress on food insecurity and malnutrition trends at the aggregate level, 739 million people faced hunger in 2022, 2.4 billion lacked regular access to adequate food and over 3.1 billion could not afford healthy diets (FAO, 2023^[1]). Food security and livelihoods of the poorest remain vulnerable to weather patterns and events induced by the climate crisis, and the impacts of such extreme events on food systems are aggravating other disruptions such as the COVID-19 pandemic and related supply chain challenges, geopolitical tensions, and food price volatility. All these factors collectively threaten to derail the process of achieving Sustainable Development Goals (SDGs) 1 and 2 to reduce poverty; eliminate food insecurity, hunger and malnutrition; and arrest natural resource degradation by 2030.

Food and agricultural systems emit close to 30% of global GHG emissions, of which 45% comes from production systems, 34% from pre- and post-harvest systems, and 21% from land-use changes (World Bank, 2024^[2]). Transforming food systems, therefore, will be central to achieving net zero goals. Many innovations could be scaled, including: improved soil nutrient management to reduce the overuse of chemical fertilisers; reducing methane emissions from flooded rice systems through alternative practices; better management of livestock systems to reduce enteric fermentation; reducing CO₂ emissions along all nodes of the value chain; reducing and effectively using food waste and loss through biomass production; and investing in effective use of renewable and solar energy for food and agricultural production (COP28, 2023^[3]). Investing in water-saving technologies can also cut down on the amount of electricity and water used in agriculture, which helps manage the water scarcity caused by groundwater depletion and withstand water shortages in droughts. Recognising and investing in the scaling of digital agricultural practices can also help build resilient food systems.

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A functioning food system that supports those who rely on it for their livelihoods is an essential bulwark against the effects of climate change for the most vulnerable. Indeed, the livelihoods of poor communities are 15 times more likely to be impacted by natural disasters such as storms, heat waves and floods than

those of non-poor communities, according to the Intergovernmental Panel on Climate Change (IPCC) (2023^[4]). Poor households spend a larger share of their income on food, which makes them more vulnerable to climate-induced food insecurity. Moreover, agri-food systems are central to the economies of many low-income countries (LICs) and middle-income countries (MICs), accounting for a significant share of their gross domestic product (GDP). For example, in 2022, agriculture accounted for 16% of GDP in India and 51% of GDP in Sierra Leone. At the regional level for example, in Sahel and West Africa, it represents 35% of the regional GDP and constitutes a livelihood for two-thirds of people (SWAC/OECD, 2021, p. 9^[5]).

Three types of practical preventative and adaptation approaches to support poor communities

One approach is to focus on reducing the risk posed by unpredictable weather patterns and extreme climate-related disasters. This includes investing in technological and digital innovations that help farmers access improved crop varieties and animal breeds able to withstand droughts and access timely information on technology, prices and input availability. Further, integrated soil, water and nutrient management practices through regenerative agriculture, precision farming and zero tillage can increase the resilience of agricultural systems. Likewise, investing in early warning systems can alert farmers to impending climate-related disasters and provide information they need to take actions to reduce risk (Leow et al., 2023^[6]). Increasing the accuracy and the timeliness of the weather forecasts can lead to higher yields and incomes for millions of smallholder farmers and help them adapt to climate emergencies through the development of risk management systems and insurance mechanisms.

Interventions that support continued income generation when climate-related shocks occur are another way to support poor communities. An example is the HarvestPlus initiative launched after the rains failed in most parts of Bihar state, India, in July 2023 (Giri et al., 2023^[7]). As most rice nurseries did not survive for timely planting of rice crops, communities were provided biofortified pearl millet seeds to sow on the same land where rice would normally have been grown and the women's self-help groups that processed the pearl millet found a market outlet for the crop. The programme not only helped communities adapt to climate-induced erratic weather changes but empowered women and addressed nutritional and livelihood needs. Removing rice from the cropping system also made a substantial contribution to reducing methane emissions from flooded rice fields. Diversifying from monoculture to multiple crops is another strategy that could increase resilience to erratic rain patterns.

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Finally, tailored interventions are needed in emergency situations to ensure that communities have access to safe, nutritious and diverse foods. The latest edition of the Standards for Supporting Crop-related Livelihoods in Emergencies manual provides the guidelines needed for emergency crop-based interventions. For example, the guideline recommends minimum standards of seeds when crop emergencies are implemented to ensure that farmers are not exposed to risks from another source. Similarly, the Livestock Emergency Guidelines and Standards offer guidance for livestock-related interventions in the event of climate disasters. For example, using the Livestock Emergency Guidelines and Standards for animal shelters rebuilt after disasters can help increase the productivity of livestock systems as they rebound (SEADS, 2022^[8]; LEGS, 2024^[9]). Supportive safety net programmes are needed to complement interventions and help meet food affordability goals.

To fulfil the IPCC's call for equitable climate action, national governments, development partners and other stakeholders in the food system are challenged to identify and scale all these types of multiple outcome

interventions. Such interventions require several fundamental changes in the way the policy, institutional, governance, accountability and capacity systems operate at the national and global levels. For example, national policies and strategies need to align with the investments and budget allocation, institutional framework and regulations should support policy and programme implementation to achieve their goals, and governance and accountability systems should be capacitated to deliver on the policy goals. This is most poignant than in agricultural strategies that combine food security and climate action goals such as reducing GHG emissions.

Leveraging international, national and local climate action to reduce poverty and hunger

Transitioning to food systems that are more equitable and locally accountable requires strategies designed for each country's specific political economy, policy-making environment, governance and accountability, and localised capacity development. Guiding these localised approaches should be a set of common principles that focus on moving from recognition of the challenges to implementing integrated approaches to overcome them.

Integrating international and national climate action with strategies for reducing poverty and hunger

International organisations are making strides to integrate proposed climate actions with goals to reduce poverty, food insecurity and malnutrition. A global roadmap to achieve SDG 2, for example, calls for transforming food systems to achieve the twin goals of limiting the rise in global temperature to 1.5°C and eliminating hunger (FAO, 2022^[10]). The roadmap proposes actions around increasing productivity, managing natural resources sustainability, reducing food loss and waste, and pursuing dietary diversity to achieve climate and biodiversity goals. The emphasis on achieving food security as a right highlights the particular vulnerability of poor communities to market failures. However, as noted in a baseline report by the Global Alliance for Improved Nutrition (GAIN, 2023^[11]), climate policy commitments rarely consider nutrition and finance is lagging policy commitments, further evidence of the need for integrating climate action with strategies for hunger and poverty reduction.

The 2025 nationally determined contributions (NDCs) update round presents a significant opportunity for strategy integration. For instance, through the vehicle of the newly created Alliance of Champions for Food Systems Transformation (2024^[12]), Brazil, Cambodia, Norway, Rwanda and Sierra Leone have committed to updating and aligning their NDCs, national adaptation plans, long-term low-emission development strategies, national biodiversity strategies and action plans, and, notably, their national food system transformation pathways by 2025.

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Examples of national-level integration are also emerging. A study of potential benefits in the context of Tajikistan concluded that integrating climate and agricultural strategies can help save scarce resources and support developing economies and their communities to cope with diverse shocks, improve productivity and the quality of their diets, and build resilience capacity for managing future shocks (Babu et al., 2024^[13]). For example, livestock for dairy is a key source of rural protein needs and a food security

shock absorber when crops produce low yields due to climate change. Livestock management practices at the farm level could be integrated with manure management for methane reduction by introducing cost-effective biodigesters for rural energy management in remote areas. In Lao People's Democratic Republic, the development of the NDC implementation plan incorporated agriculture, energy, environment, water resources and forestry sectors and their contribution to climate adaptation and contribution to net zero goals (Lao People's Democratic Republic, 2021^[14]).

Multisectoral and multistakeholder action to leverage climate action

Integrated approaches in the climate action and poverty and hunger spheres can improve overall efficiency, but the design and implementation of interventions must also cross sectoral boundaries. Targeted country-level analysis can help identify the institutional, analytical and investment gaps that need to be addressed for multisectoral action, and a policy and investment framework can help track climate resilience actions as part of the development of policies and strategies at the national level. When researchers applied the framework to Myanmar's agricultural development strategy, they found that combining food system and climate goals can help to design mitigation interventions to reduce GHG emissions from the food systems as well as adaptation strategies to protect the poor and vulnerable in the event of climate shocks – all in the context of food system transformation. For example, the analysis showed that a systems approach to a food security goal can help identify a set of multidimensional factors at different levels of decision making and co-ordination of actions to protect the poor and vulnerable populations (Babu et al., 2019^[15]).

Multisectoral approaches are especially useful at the national and decentralised local administration level, where adaptation involves multiple sectors including food and agriculture, irrigation, water resources, meteorology, and forestry. Analysis and holistic strategies followed by action have shown that multisectoral approaches can optimise investments and increase the efficiency of donor resources used in the food and climate spheres. Climate-resilient agriculture investments are a good starting point.

Inclusive consultation and donor co-ordination, though often neglected, are key to integrated action

Diversity, inclusivity and equity are emerging as key considerations to achieve positive results from climate action. Yet country consultations have found that in many cases, the consultative process leaves out key stakeholders. A just transition to a green economy is important from several perspectives. While international co-operation and co-ordination have improved over the years through global multistakeholder platforms such as the United Nations Climate Change Conference process, much remains to be done at the national and local levels (Davey, 2023^[16]). National initiatives undertaken by development partners, for example, need co-ordination. An important first step is mapping the key actors and players in the climate change policy process and identifying their roles in terms of technical support and financial commitments to various climate-related activities (Babu, Tohirzoda and Srivastava, 2024^[17]). The mapping can establish a baseline for the national government co-ordination agencies to track and monitor agencies' progress and ensure national governments' accountability in LICs and MICs. Tajikistan's experience in advancing global climate goals at the country level show that such inclusive stakeholder mapping is a long-term process but could speed up the process of evidence-based climate action by identifying key partners' varying roles and strategies (Babu and Srivastava, 2024^[18]). In Tajikistan, systematic organisation of the policy systems for setting priorities for action among the NDCs, connecting climate-oriented sectors including agri-food systems for joint actions, and strengthening national capacity for developing climate investment plans took close to two years. Multistakeholder consultations can help in the just transition process, reducing inequities and leading to an inclusive and resilient food system transformation.

Joint financing for climate action, poverty and hunger goals

Financing models that combine climate adaptation and resilience goals with poverty and nutritional outcomes are still emerging and need to be evaluated and scaled up. Mobilising finance for such integrated actions requires co-ordinated efforts on the part of the public sector, development partners, the private sector, and local and international non-governmental organisations. For example, in most developing countries, donor co-ordination committees on environment address climate-related investments and financing, while similar committees address food security and nutrition issues. Joint meetings of the two committees would help to identify overlapping opportunities to optimise resources and achieve joint climate-resilient and food security outcomes. Similar cross-sectoral co-ordination is also needed to identify the implementation gaps that are a result of the limitations of financing. Inclusive multisectoral and multistakeholder action, joint financing, co-ordination, integration of strategies alongside inclusive multisectoral and multistakeholder action and consultation can play a key role in optimising funds used in climate action.

Adapting government and donor systems to co-ordinate implementation

National governments should be the ultimate co-ordinators of investments and programmes supported by development partners, encouraging synergies and leveraging climate action and development assistance to achieve multiple development goals. Often, donor priorities and governments' strategic needs do not converge due to a lack of effective co-ordination. Such co-ordination should begin within the government system where the multiple sectors are brought together to take stock of climate actions and their implications for the climate-related ministries. While the Ministry of Environment takes the lead in climate change policies and strategies in most countries, its reach to other climate-related sectors is thwarted by bureaucratic hurdles. Effective co-ordination of multiple sectors on a regular basis is needed to promote truly integrated interventions that address climate, food systems and poverty. Understanding the institutional architecture that needs to be put in place to achieve this integration and co-ordination is country- and context-specific. However, as shown above, close co-ordination of the government institutions and donor initiatives can help. For example, the framework developed in Tajikistan in the context conducting regular multisectoral consultations helps in preparing the sectors to address common priorities, such as the work on methane reduction goals by joining the Global Methane Pledge.

Action to address climate, hunger and poverty in an integrated way will also require development partners and national governments in LICs and MICs to change their own systems. Co-ordination of policies, strategies and plans at various levels is crucial for achieving the joint goals of climate action and reducing poverty, inequality and hunger. Some initial efforts have been made to combine sectoral goals through multisectoral co-ordination, but there have been few large-scale successes. For example, working with organisations like the NDC Partnership, the Comprehensive Action for Climate Change Initiative is supporting multisectoral capacity at the national level to bring the government and donor systems together to address priority climate actions in a systematic manner¹. Such institutional strengthening processes and the importance of the role of country-level implementation of programmes and learning from such programmes to scale up and scale out cannot be overemphasised.

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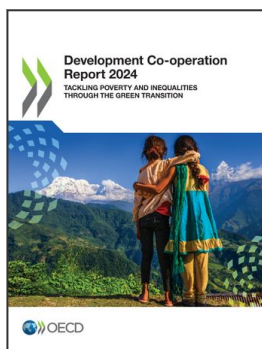
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Note

¹ For more information see www.CACCI.org.



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