Food security in changing climates

Social protection must respond to unfolding crises

Ritu Bharadwaj, N Karthikeyan and Tom Mitchell

Issue Paper
September 2024

Food and agriculture; Climate change

Keywords:
Food security, social protection, climate finance, climate resilience, least developed countries (LDCs) challenges

iied

About the authors

Ritu Bharadwaj, principal researcher, IIED, www.iied.org/people/ritu-bharadwaj

N Karthikeyan, independent development economist

Tom Mitchell, Executive Director, IIED, www.iied.org/people/tom-mitchell

Corresponding author: Ritu Bharadwaj, ritu.bharadwaj@iied.org

Acknowledgements

We thank colleagues at the Risk-informed Early Action Partnership (REAP) Secretariat for being part of the consultation that helped shape the ASPIRE toolkit and our analysis. IIED is a co-chair of the REAP's 'Linking Social Protection and Early Action Working Group. Various working group meetings provided rich inputs. We extend special thanks to the co-chairs Lara Evans, US Agency for International Development and Laura MacLean, UK Foreign, Commonwealth and Development Office. We also thank our peer reviewers Veena Bandyopadhyay of UNICEF, environmental consultant Wondwossen Sintayehu Wondemagegnehu and Daljeet Kaur of Save the Children.

Published by IIED, September 2024

Bharadwaj, R, Karthikeyan, N and Mitchell, T (2024) Food security in changing climates: social protection must respond to unfolding crises. IIED, London.

iied.org/22516IIED

ISBN: 978-1-83759-101-5

This publication has been reviewed according to IIED's peer review policy, which sets out a rigorous, documented and accountable process. The reviewers were Veena Bandyopadhyay of UNICEF, environmental consultant Dr Wondwossen Sintayehu Wondemagegnehu and Daljeet Kaur of Save the Children. For further information, see www.iied.org/research-excellence-impact

International Institute for Environment and Development
44 Southampton Buildings, London WC2A 1AP, UK
Tel: +44 (0)20 3463 7399
www.iied.org

@iied
www.facebook.com/theIIED

Download more publications at iied.org/publications

Cover photo: Climate change is having a big impact on agricultural production in Madhya Pradesh, India. Here, four villagers use the CRISP-M tool co-developed by IIED and the Madhya Pradesh Council of Science & Technology to understand where to construct a pond to store excess water during the rainy season and use it to irrigate crops.

Climate change is severely impacting global food security by affecting all four pillars: availability, accessibility, utilisation and stability. Least developed countries (LDCs) and Small Island Developing States (SIDS) are worst affected. Immediate and concerted global efforts are urgently needed. We know that social protection schemes that react and respond as crises unfurl are more cost effective than disaster response. This paper discusses how social protection can become more 'anticipatory' and make food security more resilient to climate risks. However, LDCs and SIDS need comprehensive support from the global community to implement such changes. The Brazil G20 presidency, which has chosen to prioritise food security, presents an important opportunity to drive this global effort and mobilise resources and cooperation.

Contents

Abbreviations

ASPIRE	Anticipatory Social Protection Index for Resilience
CRISP-M	Climate Resilience Information System and Planning Tool for MGNREGS
GDP	Gross domestic product
IPCC	Intergovernmental Panel on Climate Change
LDCs	Least developed countries
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
PSNP	Productive Safety Net Programme
SIDS	Small Island Developing States

Summary

In many communities, climate change severely hampers the four pillars of food security.

- Disrupted weather patterns and frequent extreme weather hamper agriculture, making food less **available**.
- Rising food prices, social inequalities and poor infrastructure worsen food **accessibility**.
- Climate-induced health issues and food safety concerns (for example escalating illness, difficulties storing food and increased pesticide use) compromise how people and countries can **utilise** food.
- Fluctuating incomes and harvests, and disrupted supply chains, make food systems less **stable**.

Ensuring food security amid escalating climate impacts requires immediate and concerted efforts. The solutions are known, but least developed countries (LDCs) and Small Island Developing States (SIDS) need comprehensive support from the global community. Brazil's 2024 G20 presidency could mobilise resources and cooperation.

The Intergovernmental Panel on Climate Change (IPCC) 2023 Synthesis Report[1] warns that climate impacts are already more widespread and severe than expected, and risks are escalating. By 2030, climate change may drive 100 million more people into extreme poverty,[2] and could cost 72 million full-time jobs globally.[3] Water scarcity could affect 3.2 billion people.[4] By 2050, with a 2°C global temperature rise, 80 million additional people could be facing hunger.[5]

Climate shocks often force households into harmful coping strategies like skipping meals, pulling children out of school and selling productive assets. In contrast, social protection programmes improve health, nutrition and livelihoods. For instance, households in Ethiopia's Productive Safety Net Programme (PSNP) maintained or improved their living standards between 2004 and 2010 despite droughts, with 62% avoiding asset sales and 36% not using savings for food.[6] Similarly, Kenya's Hunger Safety Net beneficiaries maintained living standards during the 2008–2011 droughts, while those not covered cut spending by 10%.[7] In Bangladesh, the Challenging the Frontiers of Poverty Reduction Programme increased per capita income by 42% and doubled household assets over three years.[8]

Globally, social protection programmes are integral to development. Nearly 45% of people benefit from at least one social protection programme, but social assistance reaches only about 25% of vulnerable populations.[9]

Importantly, providing anticipatory social protection before climate shocks strike offers cost-effective resilience. A study in Ethiopia and Kenya found building resilience is more economical than post-crisis humanitarian responses.[10] Similarly, a broad-based global World Bank study highlighted that every US$1 invested in resilient infrastructure yields US$4 in benefits,[11] and a UN Office for Disaster Risk Reduction study indicated that every US$1 invested in risk reduction saves up to US$15 in post-disaster recovery.[12]

This paper discusses social protection programmes, and their readiness and effectiveness in delivering food security, in eight countries with diverse climate risks. It draws on analysis carried out using the Anticipatory Social Protection Index for Resilience (ASPIRE) toolkit[13] for Bangladesh,[14] Ethiopia,[15] Ghana,[16] India,[17] Malawi,[18] Pakistan,[19] Senegal[20] and Uganda.[21] Within each country, social protection policies, systems and three social protection programmes were evaluated. ASPIRE food security indices were developed representing the four pillars of food security.

Ethiopia had consistently high scores, particularly in utilisation (78) and availability (67). This is attributed to effective targeting mechanisms, comprehensive policies, and significant investments in infrastructure and early warning systems. Senegal excelled in utilisation (78), thanks to strong health and nutrition programmes. However, it faces challenges in extending healthcare coverage and supporting migrant communities.[22] India scored relatively well in availability (55) and stability (64) despite difficulties with financial preparedness and identifying eligible beneficiaries.[23]

In contrast, Malawi scored 33 for stability, hindered by resource limitations and heavy reliance on external donors. Bangladesh and Pakistan scored poorly on availability and stability, largely due to ineffective targeting and resource limitations. Uganda and Ghana showed moderate scores across all domains. Notably, Uganda's anticipatory health interventions reduced malaria during rainy seasons.[24] However, both countries need better implementation and inter-agency coordination.

LDCs and SIDS often have underdeveloped early warning systems for climate hazards. Inefficient decision making and poorly coordinated delivery slows support during crises. Financial constraints pose significant barriers. Countries face varying climate risks and have widely differing social protection systems. Therefore, each will need customised strategies, addressing the following areas, which are discussed in Section 3.

Availability

1. **Define and map risks, and establish early warning systems.** Examples include Uganda's use of risk maps for disaster management and Bangladesh's advanced early warning systems.
2. **Develop risk-responsive policy frameworks.** Ethiopia's PSNP and Uganda's National Policy for Disaster Preparedness and Management are notable examples.
3. **Integrate climate-risk-based triggers into social protection.** Kenya's Hunger Safety Net Programme exemplifies this approach.
4. **Develop anticipatory insurance schemes.** Ethiopia's parametric insurance for crops and livestock is an example.
5. **Support environmental conservation and water management.** Programmes like India's Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Ethiopia's PSNP are effective models.

Accessibility

1. **Strengthen efforts to identify and reach people in need.** Malawi's Social Cash Transfer Programme and India's use of Aadhaar-linked bank accounts are effective examples.
2. **Address inequity, exclusion and marginalisation.** India's MGNREGS provides a rights-based approach to livelihood security with decision making at the community level.
3. **Offer portable benefits to migrant populations.** India's One Nation One Ration Card initiative is a notable example.
4. **Develop robust information systems and technology to improve delivery.** India's 'JAM trinity' and Cambodia's mobile payment system during COVID-19 are exemplary.
5. **Develop rapid disbursement mechanisms and strong collaboration with financial partners.** Bangladesh's Disaster Management Fund and Malawi's Disaster Risk Management Fund are effective models.
6. **Provide fee waivers and subsidies.** In Bangladesh, anticipatory cash transfers before floods have helped maintain food security. In India, MGNREGS offers an additional 50 days of wage employment during droughts.
7. **Build and maintain resilient roads and transportation networks.** Infrastructure projects in the Philippines have reduced food supply disruptions during typhoons. In Ethiopia, the PSNP has invested in roads and irrigation systems, which has facilitated better access to markets and improved agricultural productivity.

Utilisation

1. **Promote health holistically.** Brazil's Bolsa Família and Ghana's School Feeding Programme are effective models. Addressing mental health impacts is also crucial.
2. **Educate on nutrition and safe cooking practices.** Kenya's dietary diversity programmes and Bangladesh's community health workers are notable examples.
3. **Strengthen healthcare infrastructure and services.** Uganda's anticipatory health interventions and Malawi's improved healthcare services are effective models.
4. **Establish bodies and mechanisms for coordinating social policy.** Ethiopia's coordination between social protection and health services and Senegal's National Civil Protection Agency's collaboration are exemplary models.
5. **Support coordination between stakeholders at all levels.** Bangladesh's multistakeholder platforms and Uganda's community-based organisations are effective examples.

Stability

1. **Enhance economic stability through livelihood diversification and infrastructure investments.** Ethiopia's PSNP, Senegal's coordinated efforts, and the Asian Development Bank's infrastructure projects in the Philippines are notable examples.
2. **Put resources behind delivery mechanisms that work in vulnerable countries.** IIED's analysis[25] shows higher benefit–cost ratios for public works programmes in higher-risk contexts.
3. **Provide sustainable financing.** Diversify funding sources and use innovative financial mechanisms to ensure uninterrupted assistance. Insurance-linked securities and parametric insurance of sovereign debt are effective models.
4. **Develop contingency funds.** Uganda's National Emergency Fund and the Caribbean Catastrophe Risk Insurance Facility are effective examples.
5. **Address funding constraints through innovative financing mechanisms.** IIED's proposals for parametric insurance and carbon sequestration in public works programmes like India's MGNREGS are notable examples.

The 'Looking forward' section discusses how governments, funders, international organisations, the private sector, and civil society and local communities can jointly strive to build resilient food systems for all.

Addressing food security amid rising climate risks

Climate change is intensifying food insecurity, with the heaviest burdens on LDCs and SIDS. Social protection programmes are crucial in helping vulnerable communities sustain food access and protect livelihoods during climate crises. These programmes can break cycles of poverty and inequality. They are most effective when they anticipate need and put in place policies, systems and delivery mechanisms that can address challenges before they escalate, rather than merely reacting.

1

Climate change is driving food insecurity

Climate change is directly affecting all four pillars of food security: availability, accessibility, utilisation and stability (see Box 1). Increasing temperatures, erratic rainfall, and more frequent extreme weather such as droughts, floods and storms disrupt crop yields, reduce livestock productivity and deplete fish stocks, making food less available. Price rises, combined with climate-damaged infrastructure and social inequalities, make food less accessible. Climate-induced health issues and food safety concerns compromise how effectively food can be utilised. Climate change that makes food supplies and people's incomes fluctuate undermines stability in food systems.

The IPCC 2023 Synthesis Report[26] warned that climate impacts on people and ecosystems are already more widespread and severe than expected, and risks will quickly escalate as warming continues. Climate change is projected to drive 100 million more people into extreme poverty.[27] By 2030 it could cause 72 million full-time job losses worldwide[28] while water scarcity could affect up to 3.2 billion people.[29] If global temperatures rise by just 2°C by 2050, an estimated 80 million additional people are projected to experience hunger, with the most severe impacts felt in regions such as sub-Saharan Africa, South Asia and Central America.[30] In Box 2 we have presented how these trends would impact food security in the most vulnerable regions of the world.

LDCs and SIDS bear the greatest burden of climate impacts. Several locational, physical, socioeconomic and structural factors cause this precarious situation. High poverty levels, inadequate infrastructure, geographical isolation and a heavy reliance on climate-sensitive sectors, such as tourism, agriculture and fisheries, compound it further.

Anticipatory and shock-responsive social protection schemes can help

Governments, international organisations and development partners need to act urgently to enhance resilience in food security. Social protection programmes can play a critical role in this effort by targeting the most vulnerable populations, providing access to essential services, and improving health, nutrition and livelihoods. These programmes help marginalised communities maintain consumption levels and recover more effectively from climate-related crises, thereby breaking cycles of poverty and fostering long-term resilience.

For example, despite widespread drought and other weather-related shocks, households enrolled in Ethiopia's PSNP, which provides food and cash transfers in exchange for work to improve public assets, maintained or increased their standard of living between 2004 and 2010. Overall, 62% of participants avoided selling assets and 36% avoided using savings to buy food.[31] Similarly, Kenya's Hunger Safety Net beneficiaries, who receive regular cash transfers to support their basic needs, maintained their standard of living during the 2008–2011 droughts while those not covered decreased their spending by 10%.[32]

Social protection programmes can also help people accumulate assets, raising their incomes so that they graduate from needing the safety nets. In Bangladesh, the Challenging the Frontiers of Poverty Reduction Programme, which provided training, asset transfers and support services to ultra-poor households, increased per capita income by 42% and doubled household assets over a period of three years.[33]

BOX 1. FOUR PILLARS OF FOOD SECURITY

Food security is a multifaceted concept. The Food and Agriculture Organization[34] defines food security as when people have access to sufficient, safe and nutritious food for an active and healthy life at all times. This concept includes four key pillars: availability, accessibility, utilisation and stability.

Availability: this refers to food supplies from domestic production, imports, food stocks and food aid. It depends on agricultural productivity, food storage and distribution systems.

Accessibility: this involves having the economic, physical and social means to obtain food. It covers affordability, influenced by income levels and food prices, as well as access to markets and stores, and social factors such as discrimination and inclusion.

Utilisation: this is about the proper consumption and assimilation of food. It includes access to clean water, sanitation, healthcare and nutritional knowledge. Factors such as hygiene and cooking methods affect nutrient absorption and diet quality.

Stability: this ensures consistent food availability, access and utilisation over time. It involves minimising risks from natural disasters, climate change, price volatility and conflicts, ensuring households can withstand and recover from these shocks.

BOX 2. IMPACT OF CLIMATE CHANGE ON FOOD SECURITY IN VULNERABLE REGIONS

Around 80% of those most at risk globally from crop failures and hunger due to climate change live in sub-Saharan Africa, South Asia and Southeast Asia, where a disproportionate number of farming families are poor and vulnerable.[35]

For every one-degree Celsius increase in global temperature, global wheat production is projected to decline by around 6%.[36] In sub-Saharan Africa, agricultural yields could decrease by up to 50% by 2050, especially for staple crops like maize, millet and sorghum, leaving 86 million people vulnerable to hunger.[37] In South Asia, where rice and wheat production are crucial for food security, climate change is expected to have a significant negative impact on agricultural yields. Research conducted by the International Food Policy Research Institute projects that by 2050, wheat yields in the region could decrease by 50%, rice yields could fall by 17% and maize yields by 6%, compared to levels in 2000. These substantial yield reductions will likely intensify food insecurity challenges across the region.[38] Without adequate solutions, reducing crop yields will push more people into poverty, especially in those places already experiencing high levels of food insecurity — in Africa alone, it is estimated that 43 million people could drop below the poverty line by 2030 due to this issue.[39]

Fragile and conflict-affected states are particularly vulnerable to climate change impacts on food security. According to the World Food Programme, "65% of acutely food-insecure people live in fragile or conflict-affected countries".[40] In countries such as Somalia, South Sudan and Yemen, climate-induced droughts and flooding exacerbate crop failures and livestock losses. In Syria, 12.9 million people were acutely food insecure by 2023, driven by prolonged conflict, high unemployment and rising food prices.[41] Moreover, the continuation of hostilities, compounded by adverse weather events, regional fragility, the COVID-19 pandemic and economic instability, has kept more than half the population food insecure since 2020.[42]

Similarly, in South Sudan, flooding and conflict have destroyed crops and displaced populations, leaving over seven million people in need of food assistance.[43] In the Sahel region, desertification and drought are projected to reduce rainfall by up to 20%, further exacerbating conflict over resources and driving displacement and food insecurity.[44]

Food prices are also expected to rise due to these disruptions. In 2021, rising food commodity prices were a significant factor contributing to around 30 million more people experiencing food insecurity in low-income countries.[45] Malnutrition is expected to worsen, with an additional 500,000 projected deaths by 2050 due to deteriorating food security.[46] Fisheries, a key food source for many coastal communities, particularly in tropical regions and SIDS, are also at risk. Fish stocks in tropical oceans are projected to decline by 40% or more by 2050 due to ocean warming and acidification, threatening food security in these regions.[47]

Conversely, without social protection, climate shocks push households into destructive coping strategies such as skipping meals, taking children out of school, forgoing medical care and selling off productive assets such as livestock. These strategies can, in turn, have long-term negative impacts. Evidence shows that children born during a drought are more likely to be chronically malnourished later in childhood than those who are not.[48] Chronically undernourished children are disadvantaged throughout life. Moreover, their own children are more likely to be trapped in a cycle of poverty and undernutrition.[49] But children who have been well-nourished from birth are sick less often, achieve more at school and go on to earn more during adulthood.

Social protection programmes are already part of core development strategies governments across the globe use to alleviate poverty, achieve social cohesion and sustain economic growth. Nearly 45% of the world's population is covered by at least one social protection benefit. Thus, they can provide an effective delivery channel for enhancing food security and building climate resilience. However, currently they reach only about 25% of vulnerable people.[50]

Importantly, social protection can be far more cost-effective against climate-driven food insecurity if it is anticipatory rather than responsive. Building resilience before a crisis hits costs less than humanitarian responses afterwards. A study on the economics of early response and resilience showed that every US$1.0 spent on disaster resilience resulted in benefits worth US$2.8 in Ethiopia and US$2.9 in Kenya through reduced humanitarian spending, avoided losses, and development gains.[51] Similarly, a World Bank study shows that every US$1.0 invested in resilient infrastructure generates US$4.0 in benefits.[52] And a UN Office for Disaster Risk Reduction study shows that every US$1 invested in risk reduction and prevention can save up to US$15 in post-disaster recovery.[53]

Social protection and food security: insights from eight country assessments

ASPIRE is a diagnostic toolkit used to assess how ready countries' social protection policies, systems and programmes are for delivering resilience. We used ASPIRE to evaluate how effectively eight countries are addressing food security in the context of climate change. We developed an ASPIRE Food Security Index, which quantifies each country's ability to address food security challenges by focusing on the four key pillars: availability, accessibility, utilisation and stability.

2

The Anticipatory Social Protection Index for Resilience diagnostic toolkit, ASPIRE, developed by IIED,[54] provides a comprehensive framework to evaluate a country's readiness and effectiveness in delivering anticipatory social protection. It can be used across diverse national contexts and varying climate risks, institutional capacities and policy frameworks. ASPIRE works at two levels, examining a country's overarching policy and systems, and also individual programmes.

At the country level, ASPIRE assesses two domains within social protection planning and delivery:

1. **Policy domain:** this includes how clearly policy objectives are specified, whether the policies embrace innovation, how well they define risk, how beneficiaries will be identified and reached, and what kind of assistance will be offered. This assessment helps identify areas where policy could help make social protection programmes more anticipatory and risk responsive.
2. **Systems domain:** this covers financial capacity, administrative capacity, fiscal space, infrastructure, technology and information systems, and institutional mechanisms. The assessment identifies gaps and challenges that impede anticipatory responses within social protection programmes.

At the individual programme level, the tool assesses design and function features. It looks for efficacy, effectiveness, innovative disaster risk management instruments and a climate-focused approach, among other aspects. Assessing these areas identifies both strengths and gaps in a country's delivery strategy for its social protection programmes.

This paper draws on ASPIRE toolkit analyses across eight countries[55] — Bangladesh, Ethiopia, Ghana, India, Malawi, Pakistan, Senegal and Uganda — to develop ASPIRE Food Security Indices (see Box 3 for methodology).

The countries were selected to represent diverse climate risk contexts. These nations exhibit varying degrees of climate risk according to the INFORM Report of 2021,[56] with three of the selected countries categorised as medium risk (Senegal, Ghana, Malawi) four as high risk (Bangladesh, India, Pakistan, Uganda) and one as very high risk (Ethiopia). This selection facilitated a broad view of social protection programme performance and adaptability across the range of risk. In each country, we targeted social assistance programmes known for their superior efficacy, effectiveness and coverage. Our aim was to include a diverse array of programmes and delivery mechanisms, such as public works, food and in-kind assistance and cash transfers. We selected three programmes per country.

BOX 3. DEVELOPING THE ASPIRE FOOD SECURITY INDICES

We generated ASPIRE Food Security Indices for each of the eight study countries — Bangladesh, Ethiopia, Ghana, India, Malawi, Pakistan, Senegal and Uganda. We took the following approach.

1. **Indicator classification:** the ASPIRE assessment tool includes 69 indicators divided into two main domains. There are 36 policy and systems indicators and 33 programme-level design and function indicators. We aligned these indicators with the four pillars of food security: availability, accessibility, utilisation and stability. This classification let us evaluate how effectively each country's social protection measures support food security within the context of climate resilience. The data and analysis were based on evaluation reports, policy papers, country reports and expert consultations. This ensured that the indicators were assessed using reliable and comprehensive sources, though any data limitations were mitigated through expert validation and a peer review process.
2. **Scaling method:** we assessed the indicators aligned with each pillar to generate four scores for each country. We applied a scaling method to normalise the data, creating comparable index scores across the countries. This process produced separate scores for availability, accessibility, utilisation and stability, reflecting each country's strengths and areas for improvement.
3. **Overall country score:** the individual scaled pillar scores were averaged to generate an aggregate ASPIRE Food Security Index for each country, revealing overall readiness and effectiveness for addressing food security challenges through anticipatory social protection measures.

What do the scores reflect?

The scores provide a detailed picture of each country's performance across the four pillars of food security. High scores indicate that a country has robust systems and is effectively supporting communities in maintaining food security amid climate change. Lower scores point to critical gaps that need addressing to protect communities and achieve comprehensive food security. The scores can serve as a tool for benchmarking progress towards climate-resilient food security and for identifying key areas for policy and programme interventions.

In Figure 1, we present the food security indices of the eight countries under the four pillars of food security: availability, accessibility, utilisation and stability (for further details on individual country assessments, see note 42). The indices offer valuable insights into the effectiveness of social protection programmes and how they can be tailored to meet food security needs under diverse climate risks and vulnerabilities. More details about the assessments can be found in the country readiness reports, as referenced.

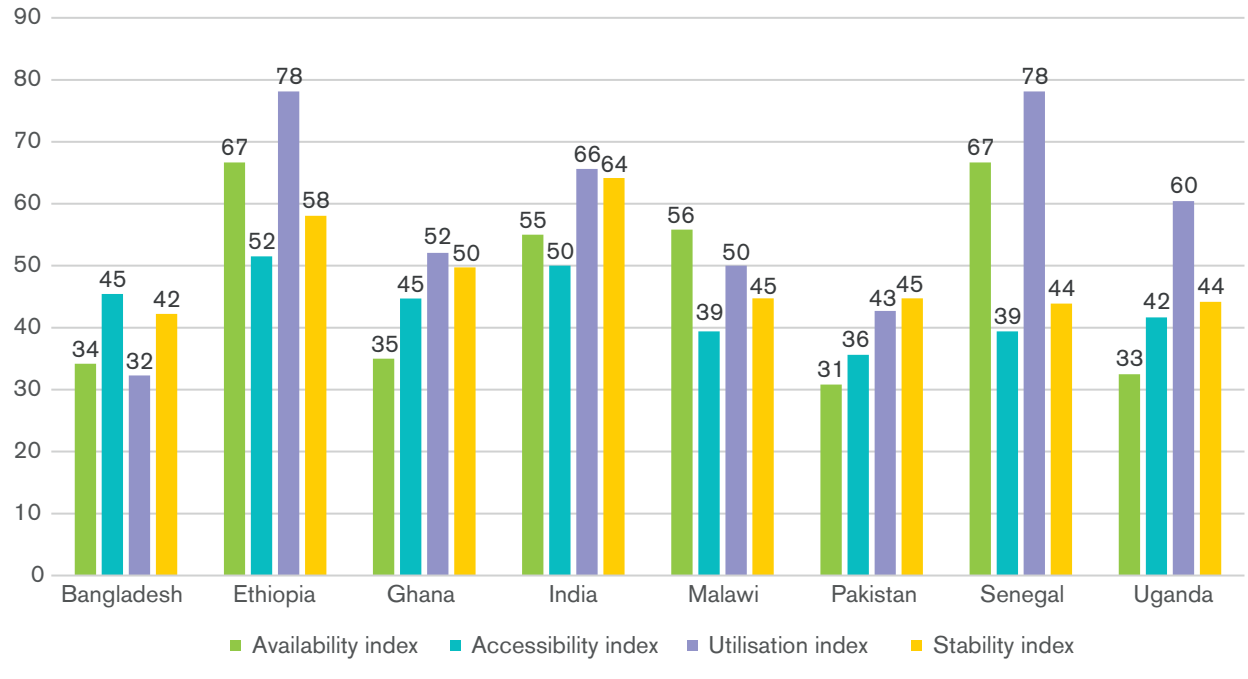
Ethiopia[57] stands out with consistently high scores across all domains, particularly in utilisation (78) and availability (67). The PSNP plays a crucial role in ensuring robust food availability, accessibility and stability. The programme's success is due to effective targeting mechanisms, comprehensive policy frameworks, and significant investments in infrastructure and early warning systems.

Senegal[58] excels at utilisation with a score of 78, reflecting strong health and nutrition programmes, efficient healthcare services and effective food safety measures. Multisectoral integration, including social protection and health services, contributes significantly to these positive outcomes. However, Senegal faces challenges in extending universal healthcare coverage and providing support for migrant communities. The policy framework needs to incorporate specific contingency plans and improved beneficiary data for better execution.

India[59] shows relatively high scores in availability (55) and stability (64). MGNREGS in particular supports food security by integrating environmental conservation activities and providing additional wage employment during droughts. This enhances income stability, helping maintain consumption levels and agricultural productivity. However, India faces challenges in delivering social protection despite the robustness of programmes like MGNREGS, the National Food Security Act (which provides foodgrain assistance to priority households through the Public Distribution System), and Pradhan Mantri Kisan Samman Nidhi (which focuses on small and marginal farmers). These challenges include difficulties in identifying eligible beneficiaries in programmes like the National Food Security Act and lack of financial preparedness. The One Nation One Ration Card initiative has improved coverage and delivery, but more work is needed in anticipatory support and disaster preparedness.

Malawi[60] demonstrates moderate scores, with particular challenges in accessibility (39) and stability (45). Despite efforts like the Social Cash Transfer Programme and the National Social Support Programme II, which target ultra-poor and labour-constrained households, resource limitations and policy gaps hinder consistent social protection coverage. While the National Social Support Programme II offers various support including income, food and healthcare, its financial sustainability is compromised by heavy reliance on external donors. Efforts in anticipatory risk financing and disaster risk financing are promising but not yet fully institutionalised.

Figure 1. ASPIRE food security indices for the four domains of food security



Bangladesh[61] and **Pakistan**[62] exhibit significant gaps in availability and utilisation. Bangladesh, with an availability index of 34, and Pakistan, with an availability index of 31, also struggle with ineffective targeting due to limited data and poor information systems. Bangladesh faces several challenges including an absence of contingency funds for anticipatory risk financing, flawed targeting mechanisms that leave many vulnerable individuals uncovered, and institutional coordination issues across various stakeholders that leads to programme duplication. However, in Bangladesh, anticipatory cash transfers made under one programme before floods have been shown to maintain food security for vulnerable households. Pakistan's social protection landscape, featuring programmes like the Benazir Income Support Programme, shows a well-articulated policy framework aimed at addressing poverty and climate resilience, but suffers from limited coverage and lack of anticipatory mechanisms for disaster response.

Uganda[63] and **Ghana**[64] show moderate scores across all domains. Uganda's anticipatory health interventions have decreased malaria prevalence during rainy seasons, highlighting the potential of targeted health services.[65] However, Uganda's National Social Protection Policies face limitations in terms of funding, reach and risk management. They need enhanced inter-ministerial coordination and improved targeting mechanisms. Ghana's social protection system includes promising programmes like Livelihood Empowerment Against Poverty and the Ghana School Feeding Programme, but the country must grapple with ineffective implementation, limited coverage, and gaps in inter-agency coordination. Ghana lags in disaster risk financing and needs to link social protection more effectively with disaster management agencies.

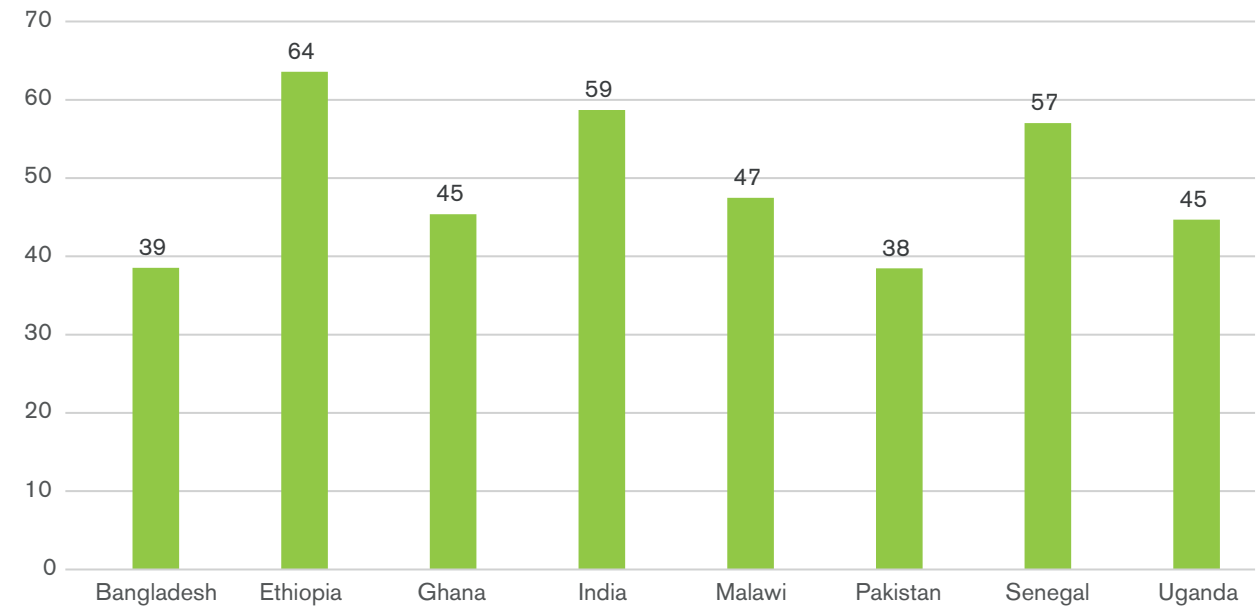
Figure 2 shows the averaged ASPIRE food security indices based on assessment of social protection policies, systems and programmes for the eight countries. The index helps in understanding the overall effectiveness and readiness of each country's social protection programmes in addressing the impacts of climate change on food security.

The overall analysis shows that despite the potential of these programmes, vulnerable countries face significant challenges in delivering effective anticipatory and shock-responsive social protection. LDCs and SIDS often have underdeveloped early warning systems that lack comprehensive climate hazard coverage. Inefficient decision making and delivery mechanisms further hinder timely support, while coordination among various stakeholders and sectors remains difficult.

Financial constraints also pose a significant barrier. Emergency responses in LDCs and SIDS often cover less than half of the population, with some countries protecting fewer than one in ten people.[66] While insurance could help bridge this financing gap, issues such as awareness, affordability and regulatory challenges limit coverage in these regions.

Moreover, countries face varying levels of climate risks and their social protection systems differ widely in coverage and effectiveness. This variability necessitates customised strategies, based on needs and contexts, if countries are to deliver resilience through social protection systems.

Figure 2. ASPIRE food security index based on the status of social protection programmes in delivering food security

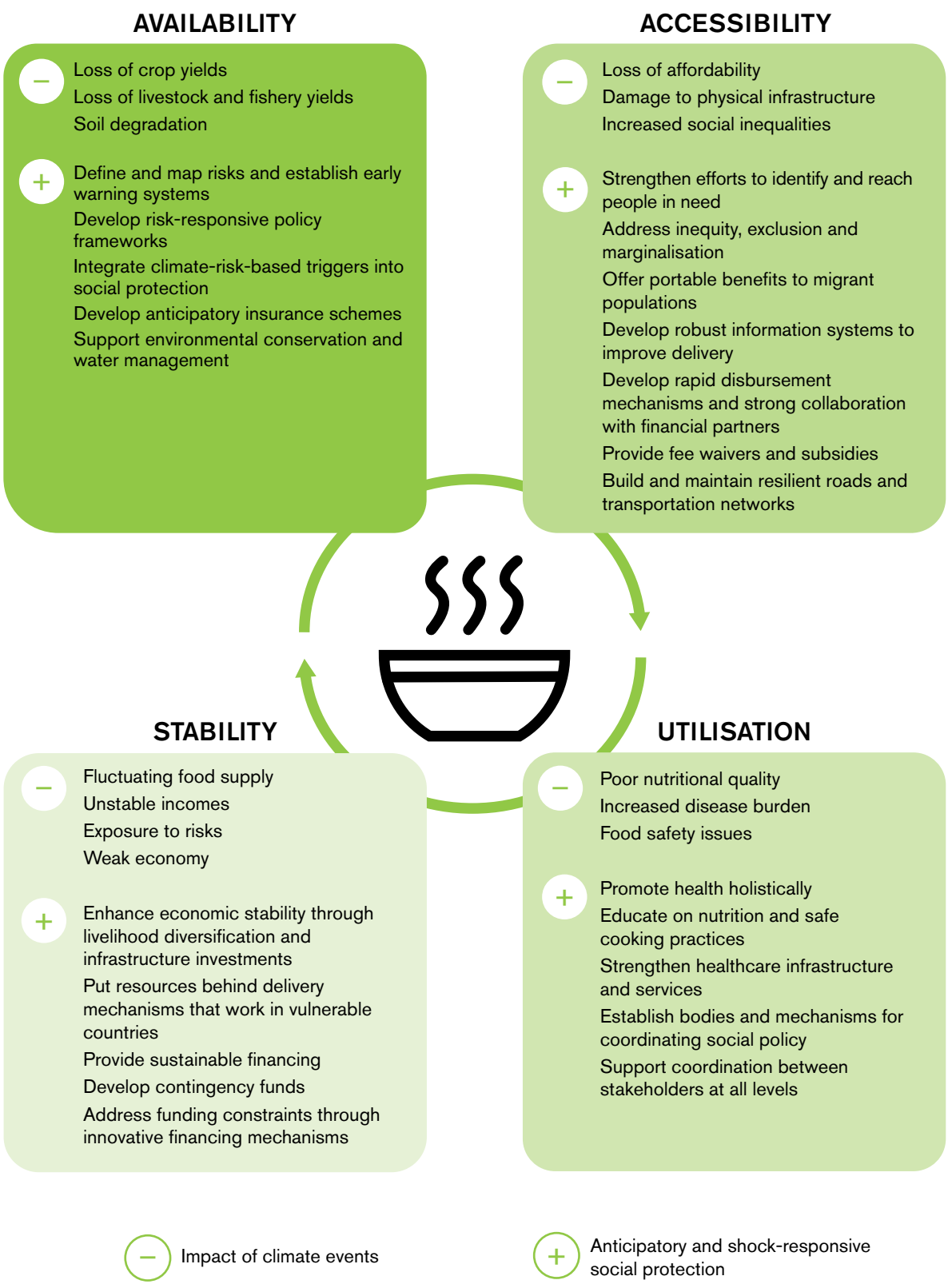


Strengthening food security through anticipatory social protection

By identifying and addressing country-specific challenges and leveraging successful strategies, many nations can use anticipatory social protection to enhance their food security and resilience against climate change. Based on our ASPIRE analyses, we make recommendations (summarised in Figure 3) on how countries can strengthen their policy, systems and programme delivery approaches.

3

Figure 3. Approach to enhancing food security through anticipatory social protection



Availability

Climate change significantly harms food availability by reducing crop yields, fisheries and livestock productivity, and exacerbating soil degradation. However, innovative and proactive approaches can help, and promoting the following elements will strengthen anticipatory social protection efforts. These systems not only provide immediate relief during crises but also build long-term resilience, ensuring sustainable food security in the face of increasing climate impacts.

Define and map risks, and establish early warning systems

Defining climate-related risks, creating comprehensive risk maps and establishing advanced early warning systems are crucial for anticipatory social protection strategies. Risk maps that identify areas most prone to specific types of disasters, and regions with high concentrations of vulnerable individuals, can guide policy objectives and programme design. Risk maps, coupled with disaster risk assessment tools like weather forecasting and climate modelling, can also anticipate potential disasters and allow for rapid resource mobilisation. For instance, the Office of the Prime Minister in Uganda uses risk maps to steer disaster management, and Malawi's Department of Disaster Management Affairs leverages weather forecasting to predict the likelihood of floods and droughts.

Policies should prioritise comprehensive early warning systems that predict climate disasters accurately. Such systems need collaboration with meteorological agencies and demand significant investment in technology and infrastructure for data collection, analysis and dissemination. Countries such as Bangladesh have made remarkable strides with their early warning systems. The country's Climate Change Strategy and Action Plan clearly outlines risks related to cyclones, flooding and coastal erosion, playing a crucial role in disaster management and minimising loss of life.

Develop risk-responsive policy frameworks

Countries need comprehensive social protection policies that strategically embed flexibility for responding to anticipated disaster risks. These risks should include slow-onset events like droughts, as well as rapid-onset disasters like cyclones and floods. This can help countries establish structured, pre-planned responses that reduce the likelihood of inefficient ad hoc decisions during crises. Importantly, these policies should delineate roles and responsibilities for wide-ranging actors — government agencies, humanitarian organisations, community groups — in the context of disaster response. For instance, Ethiopia's PSNP has a well-designed response framework aimed at safeguarding household assets and fostering productive assets in order to reinforce community resilience. With its built-in flexibility, the programme can expand its support to additional households during drought periods. Similarly, Uganda's National Policy for Disaster Preparedness and Management provides a clear mandate for various government agencies and humanitarian organisations during disasters, reinforcing a coordinated and effective response.

Integrate climate-risk-based triggers into social protection

To help social protection systems deliver resilience in the face of climate change, it is crucial to integrate climate risk-based triggers into planning and budgeting processes. This means setting up a system where specific climate risks — like extreme weather events or long-term shifts in climate patterns — automatically trigger predefined actions.

Policymakers could use risk assessments and modelling to determine thresholds or tipping points that represent conditions under which communities will need enhanced support to cope and recover from a crisis. When these thresholds are breached, alternative strategies, pre-planned in the budget, could be activated.

For instance, programmes should have built-in mechanisms to scale up during disasters. These could involve relaxing eligibility criteria and increasing the assistance offered. For example, Ethiopia's PSNP adjusts the number of beneficiaries and the amount of assistance during drought periods. Furthermore, programmes should embed shock-responsive adjustments that automatically adapt to disasters. These adjustments might include increasing the value or frequency of cash transfers, broadening coverage to include more beneficiaries or altering the assistance provided. The Hunger Safety Net Programme in Kenya exemplifies this approach by ramping up cash transfers in response to droughts. This approach ensures that social protection systems are proactive as well as reactive, enabling governments to adapt their plans and allocate resources efficiently as climate conditions change.

By embedding these triggers into the planning and budgeting process, countries can better focus their investments, potentially combining them with insurance mechanisms and other financial instruments to provide comprehensive support during climate-related crises.

Develop anticipatory insurance schemes

Anticipatory insurance schemes can act as a proactive approach to risk management within social protection. In recent years, there has been a shift away from insuring against poor crop yields and towards insuring directly against bad weather. With such an arrangement, farmers collect an immediate payout if an index or

predefined parameter reaches a certain trigger point, regardless of actual losses. For example, parametric insurance in Ethiopia provides payouts covering both crop and livestock, and is based on specific weather triggers. This allows for timely financial support to affected farmers and averts secondary impacts such as escalating poverty or food insecurity.

There is evidence that insuring against losses from natural disasters has a better benefit–cost ratio than simply bearing the restoration costs.[67] Experience suggests that index-based crop and livestock insurance can be a cost-effective alternative to humanitarian response. However, parametric insurance mechanisms will need to be tailored and costed based on diverse contexts. They must consider what communities need to prepare for, cope with and recover from a climate crisis. They should also ensure funds can be delivered under existing social protection programmes. Box 4 illustrates how insurance-linked anticipatory response can work under public works-based social protection programmes in India (MGNREGS).

This forward-looking approach encourages strategic planning and collaboration between governments, insurance companies, humanitarian organisations and communities, allowing them to develop response plans linked to insurance payouts that can be activated based on early warnings or immediately when a disaster occurs. Furthermore, anticipatory insurance can be linked to risk reduction and resilience. For example, to qualify for insurance or to reduce premium costs, countries or communities may be encouraged to put effective disaster risk reduction measures in place. This culture of preparedness can lead to significant cost savings, preventing a crisis from escalating and reducing the need for expensive humanitarian interventions. Insurance can also reduce dependency on unpredictable international aid flows, allowing countries to take ownership of their disaster risk management.

BOX 4. MGNREGS: AN INSURANCE-LINKED ANTICIPATORY RESPONSE PROVIDED UNDER A SOCIAL PROTECTION PROGRAMME

MGNREGS in India is the world's largest public works-based social protection programme. It provides a rights-based social safety net to the rural poor by guaranteeing 100 days of wage employment to every rural household. MGNREGS has an additional risk management instrument to provide another 50 days of employment in case of severe drought. But the additional employment is provided only after the drought has occurred and has been officially declared severe. This means that the affected families face a delay of two to three months before the additional wage employment is available. This limits climate resilience outcomes. Delivering additional wage employment in anticipation of an imminent climate shock could better equip households to absorb the impacts of projected climate hazards.

To tap into this potential, IIED designed the Climate Resilience Information System and Planning Tool for MGNREGS (CRISP-M).[68] To support climate-risk-informed planning and delivery of MGNREGS, CRISP-M provides a 'drought early warning system'. This allows government functionaries to start planning for additional wage employment days without waiting for a drought declaration. The tool is in the pilot phase, but the government plans to scale it across the country. This, in turn, could open up an opportunity to test insurance-linked anticipatory wage employment under the scheme. Insurance could be used to pay for additional wage employment as the crisis strikes through the following approach:

1. Use CRISP-M to strengthen climate information systems for MGNREGS so its beneficiaries receive early warning of rapid- and slow-onset climate shocks
2. Establish thresholds that trigger anticipatory wage employment in response to early warning of climate shocks
3. Develop a communication protocol to explain households' rights to shock-responsive wage employment when a climate shock is anticipated — this lets households know they do not have to migrate in times of distress
4. Set up an insurance payout mechanism to finance an additional 50 days of anticipatory wage employment based on pre-agreed trigger points for climate hazards in various regions, and
5. Establish operational guidelines to trigger action and deliver the anticipatory response.

Evidence from IIED research[69] shows that providing additional days of wage employment in response to climate shocks builds household income (financial capital) and reduces distress migration of household members in search of employment (households retain their human capital). This makes households better able to absorb climate risks and so boosts resilience.

The Global Shield initiative opens up opportunities for piloting and scaling up innovative delivery approaches for insurance-linked anticipatory response through social protection programmes. The initiative aims to provide pre-arranged financial support for fast deployment during climate disasters like floods and drought. Linking global shield insurance with anticipatory action under existing social protection programmes will allow diverse and innovative financing solutions to emerge in a range of contexts.

Support environmental conservation and water management

Public works schemes or cash transfers can motivate farmers to adopt climate-resilient practices. In India, MGNREGS integrates environmental conservation activities such as afforestation, water conservation and soil improvement projects with social protection payouts. These activities have improved water retention and soil fertility, showing how cash transfers can promote sustainable agricultural practices. By using social protection schemes to incentivise climate-resilient techniques, programmes enhance long-term agricultural sustainability and resilience. Programmes like Ethiopia's PSNP have successfully implemented small-scale irrigation projects that have allowed 4–12% of households to increase their livestock holdings and boost their incomes by 4–25%.[70]

Accessibility

Climate change makes it harder to access food. It increases prices due to crop damage, damages infrastructure and disrupts supply chains, and amplifies social inequalities. The following responses can help ensure food accessibility.

Strengthen efforts to identify and reach people in need

Social protection programmes need to specify who they will help, and should focus on the most vulnerable groups and geographies. This involves using transparent and fair indicators combined with community-based vulnerability assessments to create a clear understanding of who is most at risk. For instance, Malawi's Social Cash Transfer Programme targets ultra-poor and labour-constrained households, which are often the most vulnerable to climate-related shocks, using a combination of community-based and proxy means-testing approaches. Beyond identifying people in need, countries must have robust mechanisms to reach the most vulnerable, maximising the impact of all money spent. This requires prioritising households with children, elderly or disabled individuals, and those below the poverty line. In India, the government uses multidimensional poverty assessments and Aadhaar-linked (biometric) bank accounts to transfer social protection benefits directly to beneficiaries, removing inefficiencies and reducing corruption.

Address inequity, exclusion and marginalisation

In social protection programmes, equitable delivery is crucially important but also challenging, particularly when managing climate risks. Programmes often suffer from gender inequality, marginalisation, exclusion of some groups and lack of transparency. To tackle these challenges, it is necessary to make gender considerations and the risks faced by other marginalised groups a mainstream aspect of anticipatory risk response frameworks. Social protection programmes must cater to the diverse needs of women, men, and vulnerable groups such as single women, elderly people, children and disabled individuals. A universal database that records exposure to climate or natural hazards alongside socioeconomic vulnerability can help prioritise access to resilience initiatives. National-level programmes should incorporate rights-based frameworks and decentralised implementation architectures to ensure basic safety nets for decent work, food security and shelter before and during crises. Furthermore, overhauling management structures is vital to establish comprehensive social protection systems with cost-effective and efficient delivery. This involves developing delivery mechanisms that respond to the emerging risks, revitalising programmes to prevent communities from falling back into poverty after crises, and strengthening progress towards universal social protection.

Offer portable benefits to migrant populations

Distress migration and displacement is one of the most common impacts of climate change. When individuals are forced to migrate due to climate change, both the migrants and the family members they leave behind are more vulnerable. For those who migrate, the challenges are multifaceted. Migrants often leave behind their established social and economic networks, making them more susceptible to exploitation and abuse in unfamiliar environments. They may struggle to find stable employment, secure housing and access to healthcare in their new locations. This instability can lead to increased stress, poor mental health and a higher risk of falling into poverty. Migrants might also lack access to social protection programmes that are tied to their place of origin, leaving them without safety nets in times of need. Meanwhile, the family members left behind, who are often women, children and the elderly, also face significant challenges. These family members might lose the primary breadwinner, resulting in decreased household income and increased economic pressure. Without the direct support of a household head (who

has migrated), they may struggle to access essential services such as food, healthcare and education. For example, in rural areas of countries like Bangladesh, when men migrate to cities due to flooding, women are often left to manage households and agricultural activities without adequate support, leading to food insecurity and economic hardship. The lack of portability in social protection benefits exacerbates these vulnerabilities. When social protection programmes are region-specific, migrants cannot access benefits such as food rations, healthcare or financial support once they leave their home region. Similarly, the families left behind may lose access to these benefits if they are tied to the presence of the primary earner. This lack of continuity in social protection leaves both migrants and their families at a higher risk of falling into poverty and facing food insecurity.

To address these challenges, it is crucial to implement portable social protection benefits that follow individuals regardless of their location. For instance, India's One Nation One Ration Card initiative allows beneficiaries to access food rations anywhere in the country, ensuring that migrants and their families do not lose critical support when they move. By ensuring that social protection programmes are adaptable and mobile, governments can better protect vulnerable populations during and after migration, helping to mitigate the negative impacts of climate change.

Develop robust information systems and use technology to improve delivery

Social protection systems need periodically updated projections of climate impacts on different geographies and across varying temporal scales. This requires experimentation and innovation in data collection, risk modelling, structuring of financial mechanisms and market-based instruments, testing of forecasts and triggers, feedback loops, and disbursement channels. Innovations, using artificial intelligence and digital technologies, can help decision makers consolidate efforts and manage new risks. Technology can also help countries address the 'last mile' delivery challenge during crises. For example, countries can develop applications to forecast disasters and their associated crises such as famine, drought and political conflict and to pre-plan delivery options for varying scenarios. Innovative technologies such as digital payment systems hold significant potential for fast outreach, improved targeting and anticipatory risk finance solutions. The 'JAM trinity' in India (Jhan Dhan universal bank accounts, Aadhaar biometric identity for all, and mobile phones) provides the technology for transferring cash directly to the accounts of individuals and families. It is a classic example, among developing countries, of applying technology to advance efficiency and effectiveness in the social assistance system. Similarly, Cambodia's mobile payment system using its IDPoor database effectively and quickly reached the most vulnerable during the COVID-19 crisis.[71]

Develop rapid disbursement mechanisms and strong collaboration with financial partners

Ways to quickly disburse funds are crucial when a crisis hits. Having a mechanism in place can prevent procedural delays and speed can make the difference between recovery and a deepening crisis for vulnerable communities. When paired with anticipatory action, rapid disbursement mechanisms can provide support even before the disaster hits, reducing the impact. Bangladesh is often lauded for its effective disaster response system, and rapid disbursement is part of its success. The country's Disaster Management Fund ensures that resources are available for immediate response and recovery activities and the Climate Change Trust Fund contributes to swift action during climate-related crises.

In Malawi the Department of Disaster Management Affairs plays a central role in coordinating and mobilising resources. The country has also established a Disaster Risk Management Fund to enable rapid response in times of crisis.

Rapid fund disbursement systems should be seen as part of a larger, integrated strategy for anticipatory social protection as their effectiveness will depend on other elements of social protection systems, such as comprehensive risk assessment, early warning systems and strong coordination.

Governments will also need to establish good coordination with financial institutions and donor agencies. The government of Bangladesh often collaborates with international financial institutions, such as the World Bank and the Asian Development Bank, to ensure funds are quickly available after disasters. For instance, the World Bank approved US$165 million in financing to help Bangladesh provide cash and food assistance to poor and vulnerable households and to support food production during the COVID-19 pandemic.

Provide fee waivers and subsidies

These can make essential services and goods more affordable and accessible for vulnerable populations. In Ghana, targeted subsidies for agricultural inputs like seeds and fertilisers have helped smallholder farmers reduce costs and increase productivity, thereby enhancing food security. Using cash transfers and public works programmes can offer vulnerable populations a safety net against food price hikes. For example, in Bangladesh, anticipatory cash transfers before floods have maintained food security for vulnerable households

by providing timely financial support. In India, MGNREGS offers an additional 50 days of wage employment during droughts. This generates income while contributing to community infrastructure improvements, thereby enhancing food security.

Build and maintain resilient roads and transportation networks

Food needs to be transported efficiently, even during extreme weather events. Ensuring resilient roads helps support food availability and also food utilisation, discussed in the next section. For instance, the Asian Development Bank has supported infrastructure projects in the Philippines that improved road resilience, reducing disruptions in food supply chains during typhoons. In Ethiopia, the PSNP has invested in building roads and irrigation systems, which has facilitated better access to markets and improved agricultural productivity.

Utilisation

Climate change exacerbates challenges in using food and associated resources — the utilisation pillar of food security. It can worsen nutrition, increase disease burdens and affect food safety. The following strategies can help improve vulnerable communities' overall health and nutrition, strengthening and enhancing food utilisation.

Promote health holistically

Health and nutrition programmes are crucial for addressing the multifaceted impacts of climate change, which include economic but also non-economic losses such as physical health, mental health, and overall wellbeing. Social protection programmes should help communities manage these crises effectively, ensuring holistic support. For instance, the Bolsa Família programme in Brazil has significantly improved child nutrition, reducing malnutrition rates by about 14%.[72] Similarly, the Ghana School Feeding Programme provides nutritious meals to schoolchildren, enhancing their health and educational outcomes. These programmes focus on ensuring children receive the nutrients essential for growth and development. Ghana has also seen improvements in both food security and overall wellbeing through measures that aim to increase school enrolment rates, attendance and overall nutrition among the children. These interventions address immediate needs while also tackling broader socioeconomic factors.

Moreover, addressing the mental health impacts of climate change is essential. The floods in Malawi, for instance, not only caused physical devastation but also had severe mental health repercussions. Many survivors experienced significant psychological distress, highlighting the need for mental health support. Integrating mental health support into social protection programmes can help communities build resilience against the psychological toll of climate-induced disasters. This helps ensure comprehensive and effective responses to food security issues.

Educate on nutrition and safe cooking practices

In Kenya, community-based nutrition programmes have enhanced households' dietary diversity and reduced growth problems among children. In Bangladesh, community health workers educate families on nutrition and hygiene, significantly improving food safety and utilisation. By educating people on the importance of a balanced diet and safe food preparation methods, these programmes empower households to improve their nutritional intake and overall health.

Strengthen healthcare infrastructure and services

Robust healthcare systems can effectively address the increased disease burden caused by climate change, ensuring communities remain healthy and able to make the best use of available food. In Uganda, anticipatory health interventions have decreased malaria prevalence by 46% and mortality dropped by 83% between 2000 and 2019.[73] In Malawi, improved healthcare services have led to better management of climate-sensitive diseases, enhancing overall health and food utilisation.[74]

Establish bodies and mechanisms for coordinating social policy

Coordination across ministries such as social protection, agriculture and health is essential for integrated responses to climate change. In Ethiopia, coordination between social protection and health services has improved how comprehensive support is delivered to vulnerable populations. This inter-ministerial coordination addresses various aspects of food security, making social protection programmes more effective. In Senegal, similar coordination has successfully integrated health and nutrition programmes, reducing malnutrition rates and improving health outcomes.

It is crucial to strengthen coordination across policy for social protection, disaster response, climate adaptation and recovery strategies as well as strengthening operational coordination between sectors such as emergency services, local government units, health and education sectors and humanitarian agencies. For instance, during the COVID-19 crisis in India, the government effectively leveraged its existing social protection infrastructure, including the Public Distribution System and direct benefit transfers, to provide relief to affected populations. This effort saw coordinated actions

from the Ministry of Finance and disaster management bodies. Similarly, in Senegal, the National Civil Protection Agency works in collaboration with the health, education and local government units for a holistic disaster response. Such coordination helps align strategies and resource deployment, improving disaster management.

Support coordination between stakeholders at all levels

Coordination among people delivering social protection, both across sectors and agencies, and from local to national levels, is crucial to avoid duplication of effort and to ensure resources are allocated efficiently. This collaboration should include government agencies, nongovernmental organisations, humanitarian agencies and private sector entities. Local community involvement is critical for community awareness, involvement and better programme implementation. Communities can help identify vulnerable households, help deliver assistance, monitor programmes and ease the challenge of connecting all the way to individual households. In Bangladesh, multistakeholder engagement mechanisms have facilitated anticipatory actions, reducing food insecurity during floods. In Uganda, community-based organisations play a crucial role in delivering nutrition and health education, improving food utilisation and health outcomes.

Stability

Climate change makes food systems less stable and less reliable. It undermines food supply and people's incomes, while also exposing them to more risks. It is essential that countries implement strategies to make food stability more resilient. The following responses can help address the challenges.

Enhance economic stability through livelihood diversification and infrastructure investments

Supporting entrepreneurial skills helps communities diversify income sources and build long-term resilience. Livelihood diversification reduces dependency on climate-vulnerable jobs, thereby improving economic stability. In Ethiopia, the PSNP has scaled up support during droughts, investing in irrigation and land development infrastructure and stabilising incomes for vulnerable households. Similarly, in Senegal, coordinated efforts between social protection and agricultural policies have enhanced resilience against climate shocks. For example, programmes providing financial aid and agricultural inputs like seeds and fertilisers to farmers have helped sustain crop production during periods of adverse weather.

Improving access to markets and connecting communities to mainstream economic activities through resilient infrastructure investments is crucial. In Ethiopia, the PSNP has invested in building roads and irrigation systems, facilitating better access to markets and improving agricultural productivity. Similarly, the Asian Development Bank has supported infrastructure projects in the Philippines that improved road resilience, reducing disruptions in food supply chains during typhoons. These investments not only support immediate economic stability but also build long-term resilience against climate variability.

Put resources behind delivery mechanisms that work in vulnerable countries

It is important to understand which social protection mechanisms will be most effective in building climate resilience, especially where low-income countries face growing financial constraints.

IIED has analysed social protection instruments across 122 countries quantitatively and seven countries qualitatively.[75] The study revealed that higher-risk countries like South Sudan, Chad, India and Ethiopia had the highest benefit–cost ratios, showing greater poverty and vulnerability reduction for every unit of spending compared to lower-risk countries. Public works programmes performed particularly well in these higher-risk contexts, excelling in coverage (the ability to reach people living on less than US$1.90 a day — a high value reflects ability to identify intended beneficiaries and reduce exclusion errors), benefit incidence (how well a programme excludes people who are not poor), adequacy (a measure of how much benefit is transferred to intended beneficiaries) and per capita transfer (the amount recipients get). Programmes delivering meals in schools, and food and in-kind transfers also demonstrated high benefit–cost ratios in these areas.[76]

Although cash transfers (78%) and social pensions (62%) are the predominant instruments adopted among the 122 countries studied, they can be costly for low-income countries aiming for universal coverage. IIED recommends that such higher-risk countries diversify their investments into more suitable instruments. For instance, public works and food and in-kind transfers could be prioritised. Combining these with cash transfers can optimise resource use.[77]

In India, helping everyone categorised as extremely poor with cash transfers would require 4.8% of gross domestic product (GDP). However, tailoring the strategy and combining cash transfers with public works and food and in-kind programmes would reduce this to about 4% of GDP, achieving similar outcomes with fewer resources.[78]

Provide sustainable financing

Sustainable financing is not just about maintaining ongoing operations. It is also about being able to mitigate future risks and provide timely support when it is most needed. When funding for social protection initiatives is secure, they are better positioned to provide uninterrupted assistance to those who need it, even in the face of unexpected shocks such as climate disasters. To ensure sustainable financing, countries will need to diversify their funding sources and use innovative financial mechanisms (see further discussion below) to create a broad and resilient financial base. Diversifying funding sources can provide a buffer, enabling social protection programmes to scale up operations ahead of an anticipated crisis, thus minimising potential impacts. With enough resources secured from various sources, countries could act preventatively, instead of merely reacting to crises. Diversification can also ensure that social protection programmes are not overly reliant on a single source of funding that could be susceptible to political changes or economic downturns.

One innovative financial mechanism is insurance-linked securities. These are financial instruments whose performance is linked to disaster events. They can provide large amounts of liquidity when a disaster happens, thereby enabling a swift response. This can be particularly useful in the context of climate change, where extreme weather events are an increasingly prevalent risk.

Develop contingency funds

Contingency funds are critical for effective anticipatory finance within social protection programmes. By setting aside specific funds for disaster preparedness and management, countries can ensure rapid and effective responses when vulnerable populations face shocks. Contingency funds can provide immediate liquidity post-disaster, enabling quick response actions that can mitigate consequences and hasten recovery. For example, Uganda's National Policy for Disaster Preparedness and Management requires a National Emergency Fund for Disaster Preparedness and Management, which is tapped during emergencies to support quick response and recovery actions. By earmarking funds for disasters, Uganda ensures that its disaster response doesn't disrupt other essential government spending or rely excessively on international aid, thereby promoting national self-reliance and resilience. Contingency funds are a critical part of anticipatory social protection, allowing governments receiving early warning signals to move swiftly in the face of an oncoming crisis. They reduce administrative delays, and help ensure that vulnerable populations receive the support they need when they need it the most.

The Caribbean Catastrophe Risk Insurance Facility has provided quick payouts following hurricanes, stabilising food supply chains. In Pakistan, disaster risk financing supports recovery efforts following extreme weather events, helping to maintain food security and support affected communities.

Address funding constraints through innovative financing mechanisms

(a) Debt support based on parametric insurance and innovative sources of finance. IIED's analysis of 30 LDCs shows that if their exposure to climate hazards is doubled, their chances of defaulting on debt will increase ten times.[79] An increase in debt can force countries to reduce spending on social protection, food aid, health and so on at a time when their communities most need support. We propose exploring parametric insurance for sovereign debt, where a climate crisis (the pre-set parameter) would trigger an insurance payout to cover sovereign debt repayment during the crisis. This gives time to recover, and frees up national resources for investment in social protection. We also propose the creation of a global fund to cover insurance premiums for LDCs and SIDS, by pooling climate and other debt relief funds from the World Bank and International Monetary Fund.

Looking beyond debt relief, an international taxation regime could help address the challenges of financing anticipatory social protection measures, particularly in LDCs where low tax-to-GDP ratios hinder domestic resource mobilisation. This would involve taxing large polluters, fossil fuel companies and industries with significant environmental impacts, such as shipping and aviation. This is consistent with the 'polluter pays' principle. The revenue, collected at an international level, could be pooled and allocated to vulnerable countries' social protection schemes based on predefined triggers of climate impacts.

(b) Carbon markets and resilience bonds. Many LDCs and SIDS use public works-based social protection programmes to provide livelihood security during agriculture's lean periods or during climate shocks. These programmes have been shown to deliver better benefit–cost ratios than other social protection mechanisms like cash transfers (as discussed above). The assets/infrastructure they create also generate adaptation and mitigation co-benefits. For example, activities like water harvesting, soil and moisture conservation and plantation and land development activities lead to carbon sequestration and conserve soil organic carbon, as well as helping recharge ground water and improving biophysical indicators like biodiversity levels. The world's largest public works programme, MGNREGS in India, could sequester 186 million metric tons of carbon dioxide by 2025 and 249 by 2030.[80] Public works programmes in other countries offer similar mitigation potential. IIED proposes to tap into this potential by establishing a carbon/environmental and resilience bond market to leverage private sector investment in scaling up social protection.

Looking forward

The urgency of addressing food insecurity amid escalating climate impacts cannot be overstated, especially in LDCs and SIDS. Anticipatory social protection has an important role in bolstering food security, but vulnerable regions often lack the resources and infrastructure to implement such strategies effectively. The global community must come together in solidarity to bridge the gaps.

Without immediate and concerted efforts, climate change impacts on food security will drive millions more people into extreme poverty and chronic hunger, destabilising communities and economies worldwide. These regions need comprehensive support to develop robust early warning systems, scale up financial resources, and make their social protection programmes more efficient and effective in order to anticipate and mitigate the impacts of climate crises.

Addressing these needs requires a multifaceted approach that brings together the efforts of governments, international organisations, funding agencies, the private sector and civil society. Each of these stakeholders has a crucial role to play in ensuring that social protection systems are robust enough to withstand climate shocks and that they can deliver timely and effective support to vulnerable communities.

Governments must take the lead in integrating anticipatory social protection into national policy frameworks. This involves developing risk-responsive policies that can be activated before a disaster strikes, thus minimising the impact of climate-related shocks on food security. Governments should invest in strengthening early warning systems, improving data collection and analysis, and building the infrastructure needed to support rapid and effective responses to climate risks. Additionally, they must ensure that social protection programmes are inclusive, targeting the most vulnerable populations, including women, children and the elderly, and offering portable benefits for migrant populations. Governments should also prioritise establishing contingency funds to ensure rapid resource disbursement in times of crisis.

Funding agencies and philanthropic organisations are critical in providing the financial resources needed to scale up anticipatory social protection measures. They should focus on funding the development of innovative social protection programmes that are tailored to the specific needs of vulnerable countries and communities. These organisations should also support capacity-building initiatives to help governments and local institutions strengthen their ability to design and implement effective social protection strategies. Moreover, funding agencies should advocate for integrating anticipatory social protection into global development agendas and should work towards providing long-term, sustainable financing for these initiatives.

International organisations, including the United Nations agencies, the World Bank and regional development banks, play a pivotal role in facilitating coordination among countries and providing technical expertise and resources. These organisations should work to harmonise global standards for anticipatory social protection and support the development of tools and methodologies, such as the ASPIRE toolkit, to assess and enhance the readiness of national social protection systems. They should also advocate for including anticipatory social protection in international climate agreements and development frameworks, ensuring that food security is prioritised in global climate action.

Private sector actors, particularly insurance companies and financial institutions, have a key role in developing and scaling innovative financial products that can provide timely financial support in the event of a disaster, such as insurance-linked securities and resilience bonds. Businesses should also leverage their corporate social responsibility initiatives to invest in climate-resilient infrastructure and technologies that can support anticipatory social protection efforts. The private sector can further contribute by partnering with governments and international organisations to develop and implement solutions that address vulnerable communities' specific needs.

Civil society organisations and local communities are essential in ensuring that social protection programmes are effectively implemented on the ground. These groups should be actively involved in designing, implementing and monitoring social protection initiatives, thus ensuring that the most vulnerable people have their voices heard and their

needs met. Grassroots organisations can also play a key role in raising awareness about the importance of anticipatory social protection and advocating for the rights of vulnerable populations.

While all actors need to play their varying roles, effective coordination and collaboration among them is also essential. It will maximise the impact of interventions, avoid duplication of efforts, and ensure that resources are used efficiently.

The Brazil G20 presidency, which has prioritised the food security agenda, presents a unique opportunity to drive this global effort. Under its leadership, the G20 can galvanise international support for strengthening anticipatory social protection in developing countries. Brazil can champion the integration of climate risk analytics into social protection planning, promote sustainable financing mechanisms such as insurance-linked securities and resilience bonds, and advocate for much stronger coordination among stakeholders. By leveraging the G20 platform, Brazil can foster global commitments to provide the necessary resources and technical support to LDCs and SIDS, ensuring they are not left behind in the fight against climate-induced food insecurity.

By working together, we can build resilient food systems that protect the most vulnerable from the impacts of climate change and ensure a more secure and equitable future for all.

Notes

[1] Intergovernmental Panel on Climate Change (IPCC) (2023) Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, Geneva. www.ipcc.ch/report/ar6/syr/

[2] Hallegatte, S, Bangalore, M, Bonzanigo, L, Fay, M, Kane, T, Narloch, U, Rozenberg, J, Treguer, D and Vogt-Schilb, A (2016) Shock waves: managing the impacts of climate change on poverty. World Bank, Washington DC. http://hdl.handle.net/10986/22787

[3] International Labour Organization (ILO) (2017) World Social Protection Report 2017–19: universal social protection to achieve the Sustainable Development Goals. www.ilo.org/publications/world-social-protection-report-2017-19-universal-social-protection-achieve

[4] IPCC (2022) Climate Change 2022: impacts, adaptation, and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Chapter 4: Water. Cambridge University Press, Cambridge, UK and New York, USA.

[5] Action Against Hunger (8 November 2022) COP27: the climate crisis is a hunger catastrophe. www.actionagainsthunger.org/story/cop27-the-climate-crisis-is-a-hunger-catastrophe/

[6] Cabot Venton, C, Fitzgibbon, C, Shitarek, T, Coulter, L, Dooley O (2012) The economics of early response and disaster resilience: lessons from Kenya and Ethiopia. https://assets.publishing.service.gov.uk/media/5a748141e5274a7f99028b75/Econ-Ear-Rec-Res-Full-Report_20.pdf

[7] See note 6.

[8] Bandiera, O, Burgess, R, Das, NC, Gulesci, S, Rasul, I, Shams, R and Sulaiman, M (2011) Asset transfer programme for the ultra poor: a randomized control trial evaluation. CFPR Working Paper No. 22. BRAC, Dhaka. https://bigd.bracu.ac.bd/wp-content/uploads/2020/03/Asset-Transfer-Programme-for-the-Ultra-Poor-A-Randomized-Control-Trial-Evaluation-Revised-edition.pdf

[9] See note 3.

[10] See note 6.

[11] Hallegatte, S, Rentschler, J, Rozenberg J (2019) Lifelines: the resilient infrastructure opportunity. Sustainable Infrastructure. World Bank. https://hdl.handle.net/10986/31805

[12] United Nations Office for Disaster Risk Reduction, Our impact. www.undrr.org/our-work/our-impact

[13] Bharadwaj, R, Mitchell, T and Karthikeyan, N (2023) Anticipatory Social Protection Index for Resilience — ASPIRE. IIED, London. www.iied.org/21901iied

[14] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) Bangladesh readiness assessment: delivering anticipatory social protection. IIED, London. www.iied.org/21911iied

[15] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) Ethiopia readiness assessment: delivering anticipatory social protection. IIED, London. www.iied.org/21916iied

[16] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) Ghana readiness assessment: delivering anticipatory social protection. IIED, London. www.iied.org/21921iied

[17] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) India readiness assessment: delivering anticipatory social protection. IIED, London. www.iied.org/21926iied

[18] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) Malawi readiness assessment: delivering anticipatory social protection. IIED, London. www.iied.org/21931iied

[19] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) Pakistan readiness assessment: delivering anticipatory social protection. IIED, London. www.iied.org/21936iied

[20] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) Sengal readiness assessment: delivering anticipatory social protection. IIED, London. www.iied.org/21941iied

[21] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) Uganda readiness assessment: delivering anticipatory social protection. IIED, London. www.iied.org/21946iied

[22] See note 20.

[23] See note 17.

[24] Friends of the Global Fight, Malaria No More and the UN Foundation (2021) How can we end malaria? Lessons from around the world. Uganda country profile. https://endingmalaria.org/uganda/

[25] Bharadwaj, R (2022) Social protection to enhance climate resilience: what works where? IIED, London. www.iied.org/20821iied

[26] See note 1.

[27] See note 2.

[28] See note 3.

[29] See note 4.

[30] See note 5.

[31] Bharadwaj, R, Chakravarti, D, Karthikeyan, N and Daljeet K (2021) Comparative analysis of the efficiency of different social protection delivery mechanisms in the context of climate resilience. IIED, London. www.iied.org/20466iied

[32] See note 31.

[33] See note 8.

[34] FAO Agricultural and Development Economics Division (2006) Food security. Policy brief, Issue 2. www.reliefweb.int/report/world/policy-brief-food-security-issue-2-june-2006

[35] World Bank (17 October 2022) What you need to know about food security and climate change. www.worldbank.org/en/news/feature/2022/10/17/what-you-need-to-know-about-food-security-and-climate-change

[36] Asseng, S, Ewert, F, Martre, P, Rötter, RP, Lobell, D B, Cammarano, D, Kimball, B A, Ottman, MJ, Wall, G W, White, JW Reynolds, MP, Alderman, PD, Prasad, PVV, Aggarwal, PK, Anothai, J, Basso, B, Biernath, C, Challinor, AJ, De Sanctis, G, Doltra, J, Fereres, E, Garcia-Vila, M, Gayler, S, Hoogenboom, G, Hunt, LA, Izaurralde, RC, Jabloun, M, Jones, CD, Kersebaum, KC, Koehler, A-K, Müller, C, Naresh Kumar, S, Nendel, C, O'Leary, G, Olesen, JE, Palosuo, T, Priesack, E, Eyshi Rezaei, E, Ruane, AC, Semenov, MA, Shcherbak, I, Stöckle, C, Stratonovitch, P, Streck, T, Supit, I, Tao, F, Thorburn, PJ, Waha, K, Wang, E, Wallach, D, Wolf, J, Zhao, Z and Zhu, Y (2015) Rising temperatures reduce global wheat production. *Nature Climate Change* 5 143–147. doi:10.1038/nclimate2470.

[37] IPCC (2021) Climate change 2021: the physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK and New York, USA. www.ipcc.ch/report/ar6/wg1

[38] Nelson, GC, Rosegrant, MW, Koo, J, Robertson, R, Sulser, T, Zhu, T, Ringler, C, Msangi, S, Palazzo, A, Batka, M, Magalhaes, M, Valmonte-Santos, R, Ewing, M and Lee, DR (2009) Climate change: impact on agriculture and costs of adaptation. International Food Policy Research Institute, Washington DC. doi:10.2499/0896295354.

[39] See note 35.

[40] World Food Programme, Conflict and hunger. www.wfp.org/conflict-and-hunger

[41] Food Security Information Network (FSIN) (2024) Global report on food crises 2024. FSIN, Rome. www.fsinplatform.org/grfc2024

[42] See note 41.

[43] See note 41.

[44] See note 37.

[45] See note 35.

[46] Springmann, M, Mason-D'Croz, D, Robinson, S, Garnett, T, Godfray, C, Gollin, D, Rayner, M, Ballon, P and Scarborough, P (2016) Global and regional health effects of future food production under climate change: a modelling study. *The Lancet* 387(10031). doi:10.1016/S0140-6736(15)01156-3.

[47] Cheung, W, Lam, V, Sarmiento, JL, Kearney, K, Watson, R, Zeller, D and Pauly, D (2010) Large-scale redistribution of maximum fisheries catch potential in the global ocean under climate change. *Global Change Biology* 16(1). doi:10.1111/j.1365-2486.2009.01995.x.

[48] Fuentes-Nieva, R and Seck, PA (2010) The short- and medium-term human development effects of climate-related shocks: some empirical evidence. In: Fuentes-Nieva, R and Seck, PA (eds) *Risk, Shocks, and Human Development.* Palgrave Macmillan, London. doi:10.1057/9780230274129_7.

[49] Gubbels, P (2011) Escaping the hunger cycle: pathways to resilience in the Sahel. Sahel Working Group/Groundswell International, London/Washington DC. www.reliefweb.int/report/niger/escaping-hunger-cycle-pathways-resilience-sahel

[50] See note 3.

[51] See note 6.

[52] World Bank (2019) $4.2 trillion can be saved by investing in more resilient infrastructure, new World Bank report finds. www.worldbank.org/en/news/press-release/2019/06/19/42-trillion-can-be-saved-by-investing-in-more-resilient-infrastructure-new-world-bank-report-finds

[53] See note 12.

[54] See note 13.

[55] Bharadwaj, R, Mitchell, T, Karthikeyan, N, Raj, N, Chaliha, S, Abhilashi, R, Chinnaswamy, K, Raghini, B, Deulgaonkar, I, Chakravarti, D and McCabe, T (2023) Delivering anticipatory social protection: country readiness assessment. IIED, London. www.iied.org/21896iied

[56] Thow, A, Vernaccini, L, Nika, A, Poljansek, K, Galimberti, L and Dalla Valle, D (2021) INFORM Report 2021. Shared evidence for managing crises and disasters. Publications Office of the European Union, Luxembourg. doi:10.2760/238523.

[57] See note 15.

[58] See note 20.

[59] See note 17.

[60] See note 18.

[61] See note 14.

[62] See note 19.

[63] See note 21.

[64] See note 16.

[65] See note 24.

[66] Barba, LM, van Regenmortel, H and Ehmke, E (2020) Shelter from the storm: the global need for universal social protection in times of COVID-19. Oxfam GB, Oxford. https://policy-practice.oxfam.org/resources/shelter-from-the-storm-the-global-need-for-universal-social-protection-in-times-621132

[67] Linnerooth-Bayer, J and Mechler R (2009) Insurance against losses from natural disasters in developing countries. Department of Economic and Social Affairs, United Nations, New York. www.un-ilibrary.org/content/papers/25206656/84

[68] Bharadwaj, R, Addison, S and Reddy, M (2021) Climate Resilience Information System and Planning Tool for Mahatma Gandhi National Rural Employment Guarantee Scheme: The CRISP-M Tool. IIED, London. www.iied.org/20471iied

[69] Kaur, N, Agrawal, A, Steinbach, D, Panjiyar, A, Panjiyar, A, Saigal, S, Manuel, C, Barnwal, A, Shakya, C, Norton, A, Kumar, N, Soanes, M and Venkataramani, V (2019) Building resilience to climate change through social protection: lessons from MGNREGS, India. IIED, London. www.iied.org/10197iied

[70] World Bank Group and Global Facility for Disaster Reduction and Recovery (2013) Ethiopia's Productive Safety Net Program (PSNP): integrating disaster and climate risk management. Case study. World Bank Group, Washington DC. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/893931468321850632/ethiopias-productive-safety-net-program-psnp-integrating-disaster-and-climate-risk-management-case-study

[71] Ly, S, Nicoli, M, Shrestha, M, Palacios, RJ, Bossone, B, Tong, K, Karamba, RW, Vashakmadze, ET and Heav, C (2021) Cambodia economic update: road to recovery. World Bank Group, Washington DC. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/788321624038286598/cambodia-economic-update-road-to-recovery

[72] Silva N de J, Ribeiro-Silva R de C, Rasella D, Oliveira Alves, FJ, Campello, T, Leovigildo Fiaccone, R, Lima Barreto, M (2021) Shifts towards overweight and double burden of malnutrition among socio-economically vulnerable children: a longitudinal ecological analysis of Brazilian municipalities. *Public Health Nutrition* 24(15) 4908–4917. doi:10.1017/S1368980020004735.

[73] See note 24.

[74] Malema, M (2024) Malawi's health renaissance: prioritising health in the pursuit of universal coverage in the 2024/25 financial year. www.afidep.org/malawis-health-renaissance-prioritising-health-in-the-pursuit-of-universal-coverage-in-the-2024-25-financial-year/

[75] See note 25.

[76] See note 25.

[77] See note 25.

[78] See note 6.

[79] Bharadwaj, R, Mitchell, T and Karthikeyan, N (2023) Protecting against sovereign debt defaults under growing climate impacts: role for parametric insurance. IIED, London. www.iied.org/21426iied

[80] Ravindranath, NH and Murthy, IK (2018) Estimation of carbon sequestration under MGNREGA: achievement and potential in India. Indian Institute of Science and Imperial College London. https://assets.publishing.service.gov.uk/media/5cefa31b40f0b650d8050688/NREGA_Carbon_Sequestration_Report.pd

Related reading

IIED, Tackling climate change loss and damage by strengthening anticipatory risk response under social protection programmes: www.iied.org/tackling-climate-change-loss-damage-strengthening-anticipatory-risk-response-under-social

IIED, Tackling loss and damage in countries vulnerable to the effect of the climate crisis: improving evidence and co-generating pathways to impact: www.iied.org/tackling-loss-damage-vulnerable-countries-improving-evidence-co-generating-pathways-impact

Climate change is severely impacting global food security by affecting all four pillars: availability, accessibility, utilisation and stability. Least developed countries (LDCs) and Small Island Developing States (SIDS) are worst affected. Immediate and concerted global efforts are urgently needed. We know that social protection schemes that react and respond as crises unfurl are more cost effective than disaster response. This paper discusses how social protection can become more 'anticipatory' and make food security more resilient to climate risks. However, LDCs and SIDS need comprehensive support from the global community to implement such changes. The Brazil G20 presidency, which has chosen to prioritise food security, presents an important opportunity to drive this global effort and mobilise resources and cooperation.

IIED is a policy and action research organisation. We promote sustainable development to improve livelihoods and protect the environments on which these livelihoods are built. We specialise in linking local priorities to global challenges. IIED is based in London and works in Africa, Asia, Latin America, the Middle East and the Pacific, with some of the world's most vulnerable people. We work with them to strengthen their voice in the decision-making arenas that affect them — from village councils to international conventions.

iied

International Institute for Environment and Development
44 Southampton Buildings, London WC2A 1AP, UK
Tel: +44 (0)20 3463 7399
www.iied.org

Knowledge Products

Funded by:

This work is done with the generous support of Irish Aid and the Swedish International Development Cooperation Agency (Sida). However, the views expressed do not necessarily reflect the views of these donors.