

CARE International Climate Change Brief

Adaptation and Food Security



Food insecurity is a growing concern throughout the developing world, particularly for poor women and children. Estimates suggest that in 2010, approximately 925 million individuals were undernourished.¹ While there have been some gains in reducing hunger globally, it remains a critical challenge, and it is unlikely that the Millennium Development Goal (MDG) to halve the proportion of people suffering from hunger by 2015² will be met.³

A recent study on the future of food and farming identified six key drivers of change affecting the global food system: a growing global population; changing diets, notably an increase in demand for resource-intensive meat products; food system governance, including globalisation of markets, subsidies and trade restrictions; competition for resources, particularly land, water and energy; consumer values and ethics; and the impacts of climate change.⁴ The combined effects of these pressures mean that increasing numbers of people will be at risk of hunger in the coming years.

While recognising that all of these drivers represent significant factors in achieving food security for all, this brief is focused on the impacts of climate change on food security in developing countries. Tackling this crisis will require unprecedented efforts on the part of the humanitarian and development community, researchers, governments, private sector and civil society organisations and farmers around

the world. This brief outlines CARE's understanding of the challenge and our response.

Defining food security

'Food security exists when all people at all times have physical or economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.'⁵ Food security is influenced by four key dimensions: *availability* of sufficient food; economic, physical and social⁶ *access* to the resources needed to acquire food; *stability* of this availability and access; and *utilisation*, including nutrition, food safety and quality.

Achieving food security for all requires a coordinated effort that incorporates preventive, promotional, protective and transformative measures. Preventive measures aim to help people avoid food insecurity, and include social insurance systems such as savings groups, as well as risk management measures such as crop diversification. Promotional measures aim to reduce vulnerability to food insecurity by enhancing incomes and capacities, for example through microcredit schemes. Protective actions are relief measures, required when preventive and promotional measures fail. Underpinning these three types of action are transformative measures that seek to address issues of social inequity and exclusion.⁷

CARE seeks a world of hope, tolerance and social justice, where poverty has been overcome and people live in dignity and security. Due to its impacts on the lives and livelihoods of poor and marginalised people, climate change poses an unprecedented threat to achieving our vision. This working brief - released April 2011 - is part of a series that provides insight into CARE's climate change initiatives, experiences and approaches.

For more information on CARE's work on climate change, please go to www.careclimatechange.org.



Climate change impacts on food security

It is estimated that food production will need to increase by 50 percent by 2030 just to keep up with the demands of a growing global population.⁸ At the same time, climate change is projected to cause decreases in global cereal production of 1-7 percent by 2060, depending on the climate model used for the projection. These decreases will be greatest in developing countries, and particularly in South Asia and sub-Saharan Africa. Reduced production leads to higher food prices and increasing food insecurity, particularly for rural families in developing countries who are net buyers of food.⁹

A recent study by the World Food Programme (WFP) found that without significant reductions in greenhouse gas emissions, climate change 'will greatly increase hunger, especially in the poorest parts of the world'.¹⁰ Assuming that current trends in population growth and inequitable distribution of wealth are maintained, WFP estimate that globally, 10-20 percent more people will be at risk of hunger by 2050 than would be without

climate change. Of these, almost all will be in developing countries, with 65 percent expected to be in Africa. This has severe implications for nutrition, particularly for children. In sub-Saharan Africa, it is estimated that 10 million more children will be malnourished as a result of climate change.¹¹

The risk of hunger resulting from climate change is the result of both direct impacts on food systems, and of indirect impacts that affect the different dimensions of food security. Table 1 provides an overview of the potential direct consequences of key climate change impacts for food systems. These are general examples - the interactions between the climate and the food system are complex and vary greatly based on local circumstances. Therefore, both the climate change impacts and their consequences need to be analysed at the local level in order to plan appropriate interventions. In turn, the direct effects listed in Table 1 have indirect consequences for all four dimensions of food security: availability, access, utilisation and stability, as shown in Table 2.

Table 1: Climate change impacts and consequences for food systems¹²

Climate change impact	Direct consequences for food systems
Increased frequency and severity of extreme weather events	<ul style="list-style-type: none"> • Crop failure or reduced yields • Loss of livestock • Damage to fisheries and forests • Destruction of agricultural inputs, such as seeds and tools • Either an excess or shortage of water • Increased land degradation and desertification • Disruption of food supply-chains • Increased costs for marketing and distributing food
Rising temperatures	<ul style="list-style-type: none"> • Increased evapotranspiration, resulting in reduced soil moisture • Greater destruction of crops and trees by pests • Greater threats to human health (e.g. disease and heat stress) that reduce the productivity and availability of agricultural labour • Greater threats to livestock health • Reduced quantity and reliability of agricultural yields • Greater need for cooling/refrigeration to maintain food quality and safety • Greater threat of wildfires
Shifting agricultural seasons and erratic rainfall	<ul style="list-style-type: none"> • Reduced quantity and quality of agricultural yields and forest products • Either an excess or shortage of water • Greater need for irrigation
Sea level rise	<ul style="list-style-type: none"> • Damage to coastal fisheries • Direct loss of cultivable land due to inundation and salinisation of soil • Salinisation of water sources



Table 2: Indirect consequences of climate change impacts on the different dimensions of food security

Dimensions of food security	Indirect consequences of climate change impacts
Availability of sufficient food	<ul style="list-style-type: none"> • Reduced agricultural production locally and globally • Decreased availability of fishery and forest products • Increased pressure on food reserves • Decreased exports and increased imports
Access to the resources needed to acquire food	<ul style="list-style-type: none"> • Increased food prices • Loss of incomes due to damage to agricultural production or interruption in livelihoods activities • Need to adjust agricultural practices and other livelihood strategies to manage uncertainty of changing hazards and conditions • Increasing migration to urban and peri-urban areas
Utilisation, including nutrition, food safety and quality	<ul style="list-style-type: none"> • Health impacts including food-borne diseases and malnutrition • Dietary and nutritional changes based on changing availability of or access to preferred foods • Ability to utilise food may be affected by disease • Persons living with HIV&AIDS may experience difficulties in maintaining anti-retro viral therapies and may be more susceptible to infections • Impacts on food safety resulting from water pollution, increased temperatures and/or damage to stored food
Stability of availability and access	<ul style="list-style-type: none"> • Instability of food supplies (affecting both availability and pricing of food) • Insecurity of incomes from agriculture and fisheries • Population displacement and migration • Potential for increased conflict over resources

Differential vulnerability to climate change and food insecurity

Vulnerability to climate change, and resultant food insecurity, is a function of exposure to climate hazards, sensitivity to climate-related shocks and stresses and capacity to adapt. The level of exposure to climate-related hazards is often determined by **geography**. For example, communities in coastal areas experience much higher exposure to sea level rise and related effects such as salinisation of groundwater than communities further inland. Sensitivity is often determined by **livelihoods strategies**, with households dependent on rain-fed agriculture, pastoralism, fisheries or other natural resource-based livelihood strategies representing particularly vulnerable groups.

People’s ability to maintain food security in the face of climate change will depend significantly on their **adaptive capacity**. Adaptive capacity is significantly influenced by access to and control over critical resources, such as information and knowledge on climate change, natural resources such as land and water for agriculture, and opportunities for earning sustainable income.¹⁴

Structural and relational factors such as inequitable policies, power relationships and cultural norms also play an important role in determining adaptive capacity. This means that socially excluded groups, including female-headed households, orphans, persons living with HIV&AIDS and landless people, are highly vulnerable to the impacts of climate change and other stressors that lead to food insecurity.

In many contexts, women may face higher risks of food insecurity due to **gender inequality**. They play a critical role in agriculture and in managing household food supplies, but may lack access to services and control over important resources and decisions affecting food security. As a result, they may become trapped in a vicious cycle, with food insecurity and malnutrition making them more vulnerable to climate change, and climate change exacerbating the risk of food insecurity. CARE is particularly focused on promoting gender equality, and in particular, on empowering women to build the resilience of their families and communities to adapt to climate change and achieve food security.

Climate change adaptation and food security: mutually supportive approaches

CARE is committed to both food security and climate change adaptation as programming and policy advocacy priorities.¹⁵ We consider food security to be a basic human right and a critical element of household livelihood security, resilience, nutritional status and overall wellbeing. Our approach to food security focuses on empowering poor women and girls to realise food and nutrition security. It addresses all four dimensions of food security, including protecting and promoting resilient livelihoods to ensure adequate food availability and access; improving utilisation with a focus on nutritional status; and enhancing stability through vulnerability and risk reduction and management. Gender inequality, poor governance and climate change are recognized as drivers of food insecurity and malnutrition.



Therefore, our food security approach incorporates transformative activities that emphasise equity, women’s empowerment, rights and appropriate governance. Promoting environmental sustainability and enhancing adaptive capacity are key elements of the approach.¹⁶

Climate change is a study in injustice, as the people least responsible suffer the brunt of its impacts. CARE’s approach to adaptation is focused on increasing the capacity of people, particularly the most vulnerable groups, to adapt to climate change. This includes support for climate-resilient livelihoods; disaster risk reduction; and empowerment, advocacy and social mobilisation to address the underlying causes of vulnerability, including poor governance, gender inequality and inequitable access to resources and services.¹⁷

Our approaches to climate change adaptation and to food security share objectives of empowering socially excluded groups to reduce their vulnerability and increase their resilience. Our work on adaptation necessarily addresses food security as a key challenge facing climate-vulnerable populations, while our food security programming will in many cases contribute to people’s capacity to adapt to climate change, particularly when climate change is explicitly taken into consideration in the design of programmes. They are mutually supportive approaches. In places where people are vulnerable to both climate change impacts and food insecurity, we are increasingly adopting an integrated approach which addresses resilient livelihoods, risk reduction and the underlying causes of vulnerability and food insecurity.

The following are examples of strategies that will contribute to the mutually supportive objectives of climate change adaptation and food security:

- Increasing agricultural productivity, climate resilience and sustainability, particularly for smallholder farmers (for example, by promoting conservation agriculture practices, restoration of degraded soils and agricultural biodiversity)
- Promoting rights of vulnerable people, particularly women, to critical livelihood resources such as land and water
- Integrated water resource management
- Sustainable land use management and ecosystem services
- Technology transfer (irrigation, conservation and sustainable agriculture, biogas technology, etc.)
- Disaster risk reduction strategies
- Enhancing government capacity to implement social protection schemes
- Linking emergency food assistance to longer term food security responses
- Promotion of savings and insurance schemes
- Assessing vulnerability to and impact of climate change on the different dimensions of food security
- Improvement of food security monitoring to incorporate indicators related to gender equality, nutrition and climate variability and change
- Partnerships with other humanitarian, development and environmental organisations, research institutions, governments and the private sector to identify practical and effective responses to climate change and food insecurity
- Knowledge management and sharing across sectors, communications and awareness raising

- Climate change impacts affect all four dimensions of food security: availability, access, utilisation and stability. Design of food security programmes must therefore take climate change into account in order to ensure sustainability and impact.
- Food security and adaptation to climate change are mutually supportive approaches. They have shared objectives of reducing vulnerability and increasing resilience.
- Transformative activities that promote equity, women's empowerment, rights and appropriate governance must be incorporated in approaches to supporting vulnerable people to achieve food security and climate resilience.
- Approaches to food security must recognise climate change and environmental degradation as drivers. By explicitly integrating climate change into food security programming, actions to address food security will also increase capacity to adapt to climate change.
- Adaptation approaches must incorporate actions targeted at climate-resilient livelihoods and disaster risk reduction, as well as addressing the underlying causes of vulnerability. In many contexts, strategies to reduce vulnerability to climate change will also increase food security.
- Adopt an integrated approach which addresses resilient livelihoods, risk reduction and the underlying causes of vulnerability and food insecurity in places where people are vulnerable to both climate change impacts and food insecurity.
- Strong and urgent action on mitigating climate change is needed to avoid increasing hunger in the coming decades, particularly for poor and vulnerable people in developing countries.

¹FAO (2010). Global hunger declining, but still unacceptably high. Retrieved from: www.fao.org/docrep/012/al390e/al390e00.pdf

²UN Millennium Development Goals. www.un.org/millenniumgoals/poverty.shtml

³Foresight (2010). Synthesis Report C11: Ending hunger. Foresight Project on Global Food and Farming Futures. The Government Office for Science, London. Retrieved from: www.bis.gov.uk/assets/bispartners/foresight/docs/food-and-farming/synthesis/11-631-c11-ending-hunger.pdf

⁴Foresight (2011). The Future of Food and Farming: Executive Summary. The Government Office for Science, London. Retrieved from: www.bis.gov.uk/assets/bispartners/foresight/docs/food-and-farming/11-547-future-of-food-and-farming-summary.pdf

⁵FAO (1996). Rome Declaration and World Food Summit Plan of Action. Retrieved from: www.fao.org/docrep/003/X8346E/x8346e02.htm#P1_10

⁶Foresight (2010). Synthesis Report C11: Ending hunger. Foresight Project on Global Food and Farming Futures. The Government Office for Science, London. Retrieved from: www.bis.gov.uk/assets/bispartners/foresight/docs/food-and-farming/synthesis/11-631-c11-ending-hunger.pdf

⁷Adapted from: Devereaux, S. & Sabates-Wheeler, R. (2004). Transformative Social Protection. IDS Working Paper 232. Retrieved from: www.ntd.co.uk/idsbookshop/details.asp?id=844. The order has been changed to reflect the need to focus on preventive and promotional measures, with protective measures needed when these fail.

⁸World Bank (2008). World Development Report 2008. Washington DC.

⁹Parry, M., Evans, A., Rosegrant, M.W., & Wheeler, T. (2009). Climate Change and Hunger: Responding to the Challenge. World Food Programme (WFP), Rome, Italy.

¹⁰Parry, M., Evans, A., Rosegrant, M.W., & Wheeler, T. (2009). Climate Change and Hunger: Responding to the Challenge. World Food Programme (WFP), Rome, Italy.

¹¹Parry, M., Evans, A., Rosegrant, M.W., & Wheeler, T. (2009). Climate Change and Hunger: Responding to the Challenge. World Food Programme (WFP), Rome, Italy.

¹²Adapted from: FAO (2008). Climate Change and Food Security: A Framework Document.

¹³Adapted from: FAO (2008). Climate Change and Food Security: A Framework Document.

¹⁴FAO & WFP (2009). The State of Food Insecurity in the World: Economic crises- impacts and lessons learned. Available at: www.fao.org/publications/sofi/en/

¹⁵CARE International (2010). Global Food Security Strategy, Draft June 2010, and CARE International (2010) Climate Change Strategic Plan, 2010-2014.

¹⁶CARE International (2010). Global Food Security Strategy, Draft June 2010.

¹⁷CARE (2010). What is adaptation to climate change? Climate Change Brief. www.careclimatechange.org/publications/adaptation



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