

Climate Change, Food Insecurity and Hunger

Key Messages for UNFCCC Negotiators



Technical Paper for the IASC Task Force on Climate Change

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1. Introduction

Climate change directly affects food security and nutrition. It undermines current efforts to protect the lives and livelihoods and end the suffering of the over 1 billion food insecure people and will increase the risk of hunger and malnutrition by an unprecedented scale within the next decades. Undernutrition is already the single largest contributor to the global burden of disease, killing 3.5 million people every year, almost all of them children in developing countries.¹ Unless urgent action is taken, it will not be possible to ensure the food security of a growing world population under a changing climate.

This paper highlights some of the projected impacts of climate change on food security and summarizes the responses called for by several of the largest humanitarian and development organizations involved in the fight against hunger. The key messages of the paper are listed on the right.

To address this unmatched challenge, a strong commitment of the international community, particularly the developed countries, is needed. The current negotiation process offers opportunities to identify and endorse some of the actions needed. However, large efforts will be required beyond Copenhagen.

Key Messages: Food Security in a Changing Climate

1. Climate change will act as a multiplier of existing threats to food security: By 2050, the risk of hunger is projected to increase by 10 – 20 %, and child malnutrition is anticipated to be 20 % higher compared to a no-climate change scenario.
2. Achieving food security under a changing climate requires substantial increases in food production on the one hand, as well as improved access to adequate and nutritious food and capacities to cope with the risks posed by climate change on the other hand.
3. Governments must be assisted in enhancing food production and access, scaling up social protection systems and improving their ability to prepare for and respond to disasters.
4. Community-based development processes need to be fostered in order to enable the poorest and most vulnerable to build sustainable and climate resilient livelihoods and move out of chronic poverty and food insecurity.
5. The humanitarian community must get prepared for more extreme weather events and protecting the already food insecure better by strengthening both crisis response and crisis prevention.

¹ Black RE, Allen LH, Bhutta ZA, et al., *Maternal and child undernutrition: global and regional exposures and health consequences*. Lancet 2008; 371(9608): 243-60; WHO, *Protecting Health from Climate Change: World Health Day 2008*. WHO, 2008

2. Existing Challenges to Food Security

In the last fifty years the world population has more than doubled: from 3 billion to 6.7 billion people. Over one billion of them are undernourished – an unacceptable situation and a big challenge to global efforts to end hunger and poverty. In the next forty years, world population will increase by another 50 %, reaching more than 9 billion by 2050. Meeting the demand of such a large population will put

enormous additional pressure on food production systems. Regardless of climate change, demand for food will increase, while resources needed for its production, such as land, water and petrol-based fertilizers – are becoming scarcer and scarcer. The risk of hunger is very likely to increase by a large extent in the next decades due to a number of factors described below – even if the climate was not changing.

3. Climate Change – a Multiplier of Food Security Risks

Climate change will act as a multiplier of existing threats to food security: It will make natural disasters more frequent and intense, land and water more scarce and difficult to access, and increases in productivity even harder to achieve. The implications for people who are poor and already food insecure and malnourished are immense.

Particularly in the least developed countries and small island developing states, it is the livelihoods and lives of the poorest and most vulnerable, including women, children and marginal communities, which are also at greatest risk to suffer from the potential impacts of climate change. This is due to their high exposure to natural hazards, their direct dependence on climate-sensitive resources such as plants, trees, animals, water and land, and their limited capacity to adapt to and cope with climate change impacts. This ability depends to a large extent on the level of economic development and the means required for adaptation, such as economic entitlements, land, capital, credit and/or tenure rights. It also depends on institutional support and the possibility to influence decision-making.

Climate change will affect all four dimensions of food security: availability, accessibility, stability, and utilisation. It will reduce food availability, because

it negatively affects the basic elements of food production – soil, water and biodiversity. Rural communities face increased risks including recurrent crop failure, loss of livestock and reduced availability of fisheries and forest products. Changing temperatures and weather patterns furthermore create conditions for the emergence of new pests and diseases that affect animals, trees and crops. This has direct effects on the quality and quantity of yields as well as the availability and price of food, feed and fibre.

At the same time, more extreme weather events will have serious impacts on livelihood assets in both rural and urban areas and threaten the stability of food supply. Many countries are already dealing with climate change impacts resulting from irregular, unpredictable rainfall patterns, increased incidence of storms and prolonged droughts. Decreasing availability of water and food will also increase sanitation and health problems and increase the risk of diseases and malnutrition. Competition over increasingly scarce resources will also increase the risk of conflicts, displacement and migration, which in turn will again increase the risk of food insecurity.

Selected projected regional impacts of climate change on food production:

In tropical and sub-tropical regions, especially in seasonally dry areas, crop and animal productivity may decrease significantly due to temperature increases of 2 to 3°C. By 2020, climate change could cause, for example:

- significant decreases in crop yields in some rain-fed African systems;
- declines of 40 to 90 % of grassland productivity in semi-arid and arid regions;
- high levels of desertification and soil salinization in some areas in Asia, sub-Saharan Africa and Latin America;
- increasing water stress, particularly in irrigated production systems;
- increased salinity from sea-level rise, leading to some areas in sub-Saharan Africa and South Asia, such as coastal plains, becoming flooded or unsuitable for agriculture.²

Reduced food availability due to decreasing yields as a result of climate change has additional direct implications for food accessibility: As food becomes scarce, prices go up and food becomes unaffordable, i.e. inaccessible, for a growing part of the population. The food price spike that peaked in 2008 clearly demonstrated how major fluctuations in global food markets can have far-reaching implications for food security and emergency relief needs. At the same time, the food price spike led to a dramatic increase in the global total of undernourished people by more than 20 % to over a billion in July 2009.³ Some 125 million children are predicted to be underweight in 2010 if economies do not grow, 5 million more than if progress had continued at the 2007 rate. Even the pre-recession rate of improvement was inadequate to meet the MDG target.⁴ While prices fallen overall

from the peak levels achieved in 2008, they are expected to remain on average 35 to 60 % higher than in the past decade.

As outlined above, even without climate change further increases in food prices are expected. Recent modelling and analysis predicts additional price increases due to climate change for some of the most important agricultural crops – rice, wheat, maize, and soybeans.⁵ To the resulting increases in the number of people at risk of hunger, climate change is projected to add another 10 to 20 % by 2050.⁶ Calorie availability in 2050 is likely to have declined relative to 2000 levels throughout the developing world: 24 million additional malnourished children, 21 % more than today, are anticipated – almost half of them, 10 million, in sub-Saharan Africa.⁷

4. Ensuring Food Security in a Changing Climate

There are four main entry points for adaptation and risk reduction strategies aiming at increased food security in view of climate change. Part of the solution is to increase food availability. Another lies in strategies that ensure that those who are at greatest risk of hunger can actually access and benefit from increased amounts

of food and that protect the most vulnerable from the immediate impacts of climate change. This involves improving disaster risk management, enhancing social protection schemes (including the delivery of direct nutrition interventions) and strengthening resilient community-based development.

² Intergovernmental Panel on Climate Change (IPCC), *Climate Change, Impacts, Adaptation and Vulnerability: Work Group II Contributions to the IPCC*, 2007

³ FAO, *How to Feed the World in 2050*, 2009

⁴ UN Standing Committee on Nutrition, *Global recession increases malnutrition for the most vulnerable people in developing countries*, 2009

⁵ International Food Policy Research Institute (IFPRI), *Food Policy Report 21: Climate Change: Impact on Agriculture and Costs of Adaptation*, 2009.

⁶ This assumes a pathway of continuing high population growth, regional disparities of income and high global temperatures (SRES A2); Parry *et al.*, *Climate Change and the Risk of Hunger: The Scale of the Challenge and Required Response*, WFP, 2009

⁷ IFPRI 2009; Parry *et al.* 2009

Increasing Agricultural Productivity, Resilience and Sustainability

Local people are the on-site land managers who play central roles in adapting agriculture⁸ and food systems to meet their needs under changing climate conditions. The concept of adapting to climate impacts is not new to them. Traditionally, coping mechanisms for adapting to seasonal and annual climate variability have included sharing local knowledge on varieties, farming systems, management technologies etc. But the need to increase production, coupled with the speed and magnitude of the expected changes in climate, poses new challenges.⁹

Traditional coping mechanisms will not be sufficient to ensure food security and prevent effects on nutritional status. They must be complemented by the introduction of technical innovations and enabling frameworks. More research is needed on the breeding of new and adapted as well as the preservation of traditional, locally adapted varieties that can tolerate climate variability and are suitable for changed climatic conditions; the development of innovative but practical technologies such as alternative cropping systems, conservation and precision agriculture, and sustainable forest management; and the application and improvement of technologies for more efficient use of inputs such as energy, fertilizer, water, seeds. For all technological innovations in agriculture it is crucial that they will be easily accessible and affordable for the communities in need.

Adaptation strategies must also be supported by strong institutions and enabling policy and legal frameworks. Incentives and services for rural producers that can stimulate and guide adaptation processes and link producers to markets are also important supporting mechanisms. Adaptation to climate change can incorporate a range of successfully tested methods and technologies derived from sustainable agriculture and natural resource management and equitable and inclusive rural development approaches, building on the “no-regrets” principle.¹⁰ However, adaptation often

involves substantial investments and changes in practices that may take a long time to implement or show benefits. It must therefore be complemented by other responses that address the immediate effects of climate change and protect those who cannot adapt.

Improving Disaster Risk Management

The number of people affected by disasters has more than tripled since the 1990s. In 2007 over 74 million people were victims of humanitarian crisis. As climate change leads progressively towards increased extremes – storms, droughts, and high temperatures – the challenge to the humanitarian community is not only to respond to the crises, but also to be better prepared and to be able to manage the risks more effectively.

Recent approaches that integrate relief and response in long-term risk management have begun to influence the way disaster management programs are planned and financed. In order to enhance community safety and resilience, the complex interactions between long-term risk reduction and short-term response need to be better understood. At the same time, the most vulnerable to food insecurity must be protected from the immediate impacts of climate change now.

Planning appropriate risk reduction and response requires an understanding of risks and vulnerabilities in terms of who are the vulnerable, where they are and why they are vulnerable. There is a need for improved monitoring, information systems and forward looking risk analysis. Particular efforts are needed to target the poorest and food insecure people without assets and entitlements in risk reduction or response interventions. In addition to a rural focus, attention has to be given to urban and peri-urban areas.

As vulnerable people and communities themselves should always be the primary owners and drivers of any actions aimed at increasing their resilience to disasters, it is crucial to directly involve them in planning and implementation of disaster risk reduction. At the same

⁸ Agriculture in this paper includes the forestry and fisheries sectors.

⁹ Another challenge is the need to lower the negative impact agriculture has on climate change. An efficient mix of mitigation and adaptation solutions that limits both climate change and its impacts is required. If planned appropriately, climate change adaptation and mitigation initiatives can integrate with sustainable development initiatives with mutually beneficial outcomes for current and future food security.

¹⁰ “No regrets” means supporting preventive practices and actions for dealing with expected problems, even if they are not yet certain to occur. Such actions are subject to the twin criteria of being necessary in the case of climate change impact and being beneficial even in the absence of the impacts. Thus, there would be no regrets for having taken the action.

time, in order to achieve greater effectiveness, disaster risk management and climate change adaptation management should also be linked and better integrated into national development plans and strategies, starting from poverty reduction strategies, food security strategies and sustainable development.

Moreover, the gaps between sectoral organizations must be bridged in order to share timely and relevant information concerning risks and their management. Climate information must be made accessible to affected communities and decision-makers. Last, but not least, sufficient financial resources are a prerequisite for effective disaster risk reduction. Current practice indicates that less financial resources are being made available for disaster risk reduction than for adaptation.

Enhancing Social Protection Schemes

The existing inequities in food security, food safety and nutrition are likely to be further widened by the adverse consequences of climate change. Adapting food production systems has the potential to significantly increase the resilience of poor farmers to changing climate conditions. However, the vast majority of the 1 billion undernourished people do not have sufficient capacities and resources in order to adapt to or cope with the risks posed by climate change. They are in urgent need of public support in the form of social protection schemes, safety nets and other supportive measures.

Such public actions have large potential to increase resilience to climate change by contributing to breaking vicious cycles that lead into chronic poverty traps. Droughts, for example, frequently force poor families to sell off productive assets such as livestock; other shocks often lead to families taking children out of school and to reduction in households' food intake, number of meals, restriction of portion sizes, and purchase of less expensive but less nutritious foods – each with immediate and long-term physical and mental consequences for children. Eventual recovery becomes much more difficult as a result of such emergency “coping” measures. Environmental risks are among the most frequent, costly and impactful causes

of such shocks – a problem that will grow immensely with climate change.¹¹

Social protection relevant to food insecurity, climate change and resource scarcity includes cash and in-kind transfers, such as Ethiopia's Productive Safety Net Programme, which transfers cash (and food) during seasonal food insecurity through employment on public works; employment guarantee schemes, which can be used to invest further in climate resilience, for example strengthening embankments or planting trees; Mother and Child Health and Nutrition and School Feeding programs; weather-indexed crop insurance; micro-finance services; as well as emergency food assistance interventions. It also encompasses essential nutrition interventions, such as the distribution of micronutrient supplements for mothers and young children as well as fortification of foods as appropriate, and the treatment of severe acute malnutrition.

Access to formal social protection systems remains very limited in developing countries. At present only 20 % of the world's people have access to formal social protection systems.¹² Financing social protection support is complicated by the fact that safety nets need to be financed in a counter-cyclical manner, given that needs are greatest when economic performance is weakest. Effective targeting of the poorest and most vulnerable people is also critical, which fundamentally depends on policymakers understanding the vulnerabilities of these people. Apart from financial resources, formulating social protection policies hence demands significant institutional capacity, which international actors can help to build.

Strengthening Resilient Community-Based Development

Life-saving interventions to protect the food insecure people and their livelihoods from rapid-onset emergencies caused by climatic events are essential. It is equally important, however, to create enabling conditions to ensure that communities affected by disasters are able to build back systems which are better adapted to changing climate conditions. Supporting a transition towards “climate-smart” relief, rehabilitation and development that improves

¹¹ Parry *et al.* 2009

¹² Chronic Poverty Research Centre, *The Chronic Poverty Report 2008-09*, 2008

the livelihoods of low-income farmers and rural people and thereby increases their overall resilience must be considered the basis of adaptation.

Two thirds of developing country farmers farm on marginal lands, often on degraded soils. They form the majority of the food insecure and are most vulnerable to climate change. Yet experience shows the right strategies can transform their lives and create climate-resilient communities. Agro-ecological paths show enormous potential, if combined with equally crucial – and often neglected – strategies to empower farmers to influence policy formulation and implementation.

The many cases of degraded farms doubling production within a few years after adopting agro-ecological practices shows that such farms can ‘jump’ to a higher threshold, and enter a ‘virtuous circle’ of environmental restoration, renewed productivity, and greater resilience to current seasonal climatic stresses. Agro-ecological measures for delivering food security, climate change adaptation or mitigation typically

deliver the other two objectives as well, delivering a “win-win-win” outcome. Achieving resilient communities, which involves people achieving increased material welfare and reduced risk, is bound up with people attaining greater capacity to determine their own destiny. Three factors are crucial: (a) The prospect of major new investment flows focused on previously neglected lands, (b) Incentivizing farmers through investments in agro-ecological practices and in providing environmental services, and (c) Communities influencing policy making and implementation.

Investments supporting community development in view of food security should target responsive institutions grounded in the local context; expanded and improved livelihood options; sound gender dynamics and full gender equality - women must be integral to food security and resilience solutions; enhanced human capacity, building on local knowledge, and adequately connected with institutions at all levels, and creating a restored, diversified natural resource base.

5. Conclusion

Climate change poses an unprecedented challenge to the aim of eradicating hunger and poverty. In order to meet the growing demand for food security and nutrition under increasingly difficult climatic conditions and in a situation of diminishing resources, the world must urgently move towards embracing a two-fold approach: First, we must invest in and support the development of more efficient, sustainable and resilient food production systems. Second, we must improve access to adequate food and nutrition by the most vulnerable and at risk populations and

communities and enhance social protection systems and safety nets as part of the adaptation agenda. Protecting the most vulnerable also requires enhancing our capacities to manage weather-related disaster risks and accelerating community development. Only if we succeed in making significant advances on all fronts –increasing food availability, enhancing access to food, and strengthening resilience and development – we will reduce the risk of dramatic increases in the number of hungry people among the poorest countries in the most vulnerable regions of the world.

