Malnutrition and climate vulnerability in Africa

MEAN TEMPERATURE
Average temperatures are expected to increase across the globe in the coming decades. In mid to high latitudes, increasing average temperatures can have a positive impact on crop production, but in seasonally rainy and tropical regions, the impact is likely to be detrimental.

MEAN PRECIPITATION
On average, an increase in global precipitation is expected, but the regional patterns of rainfall will vary: some areas will have more rainfall, while others will have less. There are high levels of uncertainty about how the pattern of precipitation will change, with little confidence in model projections on a regional scale. Areas that are dependent on seasonal rainfall, and those that are highly dependent on rain-fed agriculture for food security, are particularly vulnerable.

EXTREME EVENTS
Recurrent extreme weather events such as droughts, floods, and tropical cyclones threaten livelihoods and undermine the capacity of communities to adapt to even moderate shocks. This results in a vicious cycle that generates greater poverty and hunger. The impacts on food production of extreme events, such as droughts, may cancel out the benefits of the increased temperature and growing season observed in mid to high latitudes.

HEAT WAVES
Events that are considered extreme today will be more common in the future. Changes in temperature extremes even for short periods can be critical, especially if they coincide with key stages of crop development.

HEAVY RAINFALL AND FLOODING
While uncertain, it appears that there will be more heavy rainfall events as the climate warms. Heavy rainfall leading to flooding can destroy entire crops over wide areas, as well as devastating food stores, assets (such as farming equipment) and agricultural land (due to sedimentation).

MELTING GLACIERS
Melting glaciers initially increase the amount of water flowing in river systems and enhance the seasonal pattern of flow. Ultimately, however, loss of glaciers could cause water availability to become more variable from year to year as it will depend on seasonal snow and rainfall, instead of the steady pattern of flow. Ultimately, however, loss of glaciers could cause water availability to become more variable from year to year as it will depend on seasonal snow and rainfall, instead of the steady pattern of flow. Ultimately, however, loss of glaciers could cause water availability to become more variable from year to year as it will depend on seasonal snow and rainfall, instead of the steady pattern of flow. Ultimately, however, loss of glaciers could cause water availability to become more variable from year to year as it will depend on seasonal snow and rainfall, instead of the steady pattern of flow.

DROUGHT
Meteorological drought (the result of a period of low rainfall) is projected to increase in intensity, frequency and duration. Drought results in agricultural losses, reductions in water quality and availability, and is a major driver of global food insecurity. Droughts are especially devastating in arid and semi-arid areas, reducing the quantity and productivity of crop yields and livestock. Seven hundred million people suffering from hunger already live in semi-arid and arid zones.

TROPICAL STORMS
For many and in all regions, one in 20-year extreme temperature events are projected to be hotter. Events that are considered extreme today will be more common in the future. Changes in temperature extremes even for short periods can be critical, especially if they coincide with key stages of crop development.

CHANGES IN HEALTH AND NUTRITION
Climate change has the potential to affect different diseases, including respiratory illness and diarrhoea. Disease results in a reduced ability to absorb nutrients from food and increases the nutritional requirements of sick people. Poor health in a community also leads to a loss of labour productivity.

SEA LEVEL RISE
Increases in mean sea-level threaten to inundate agricultural lands and saline groundwater in the coming decades and centuries. Sea-level rise will also increase the impact of storm surges which can cause great devastation.

For more information on food security and climate change and for references for the poster, please visit www.metoffice.gov.uk/climate-change-guide/impacts/food or www.wfp.org/climate-change

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Josette Sheeran, WFP Executive Director

Every day WFP reaches the world's hungriest and most malnourished people, affected by storms, floods and droughts. These weather-related disasters leave millions vulnerable. Through community adaptation programmes and nutrition interventions, WFP helps vulnerable communities build resilience and adapt.

Linking climate science and food security

Although some regions could benefit from climate change, in others it may offset gains in food security from economics and social development. Planning for climate change is made more difficult by uncertainties in our understanding of climate impacts on food security. This uncertainty is caused by a number of factors. Climate science itself is uncertain, which means that information, particularly at high levels of detail, must be treated with caution. Some of the broad trends, such as the climate we are used to understanding, but what will happen at a local level is far more difficult to determine. There is also a lack of understanding of how crops respond to changes in weather and climate. Finally, to understand food security it is essential to analyse the effects of climate change in the context of complex socio-economic interactions and development, which are difficult to anticipate.

Despite the level of uncertainty, it is possible to make decisions that place based on a pragmatic understanding. There is much that scientists do know about the climate and many tools and research options for better understanding can be extracted from climate model experiments. Expert interpretation of results by climate scientists and careful consideration of this information with food security expertise are essential.

A fundamental challenge is the lack of integration across disciplines: generally, modelling studies have simulated food security at a food availability level but neglect the stability and utilisation. It is important to evaluate climate science together with information about socio-economics and human vulnerability. This requires a more systematic integration of climate science with food security vulnerability analysis to begin to develop a more robust understanding of the impacts of climate change on hunger at the global, regional and national levels. Food security policies should also be flexible, focusing on reducing risks, building capacity at different levels, and enhancing resilience. In this way, it will be possible to manage risk, adapt to a range of different outcomes, and act despite the uncertainty.

Although still in progress, the Climate and Hunger Vulnerability Index – the Hunger and Climate Vulnerability Index – illustrates the complex interactions between food security and climate change. In this case, vulnerability is defined as the degree to which food security is threatened and the extent to which populations to adjust to the climatic changes. In this case, vulnerability is defined as the degree to which food security is threatened and the extent to which populations are exposed to the impacts of climate change. The Hunger and Climate Vulnerability Index – the Hunger and Climate Vulnerability Index – is a small step in addressing the issue of integration. By combining the knowledge of climate science and food security experts, this index can be used to develop a working tool for planners. This would enable decision-makers to access the best available information about climate change and food security for their region, to build resilience and reduce the risk of future hunger.