

Climate change, food insecurity, and poverty: a turning point?

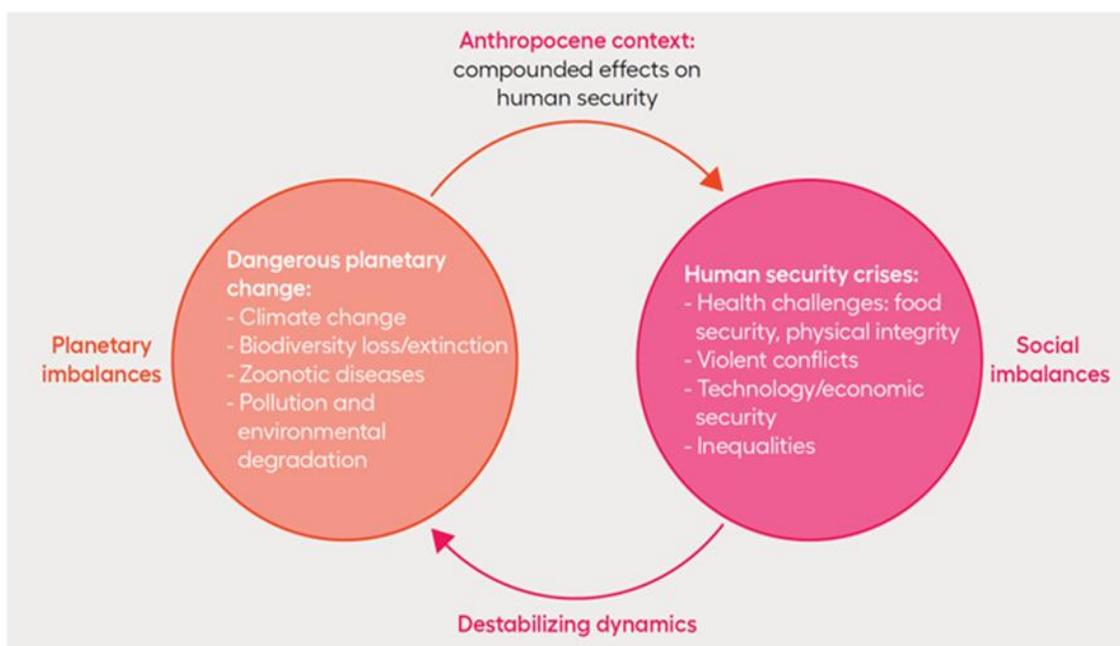
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1. The Anthropocene context

We are facing the Anthropocene context, an unprecedented period in human history, characterized by drastic human-led transformations in planetary systems. This new context is the result of the embeddedness of social systems on planet earth and their intrinsic interaction.² As a result of the anthropogenic planetary pressures, now we face dangerous trends: climate change, biodiversity loss, zoonotic diseases, and pollution. These trends have compounded effects on human security (including food security), which create social imbalances in the form of poverty, inequality, and social tensions. The highly unequal distribution of costs and benefits of these interactions tend to reinforce the continuation of this highly destabilizing cycle (see figure 1). **There is a risk that we might be at the start of a new cycle of heightened food insecurity and human deprivations.**

Figure 1



Source: UNDP (2022).

¹ Human Development Report Office, United Nations Development Programme. Paper prepared for the Virtual Inter-agency Expert Group Meeting on Implementation of the Third United Nations Decade for the Eradication of Poverty (2018-2027). Based on background research for the Special Report on Human Security. UNDP (United Nations Development Programme) 2022.

² See UNDP (United Nations Development Programme) 2020.

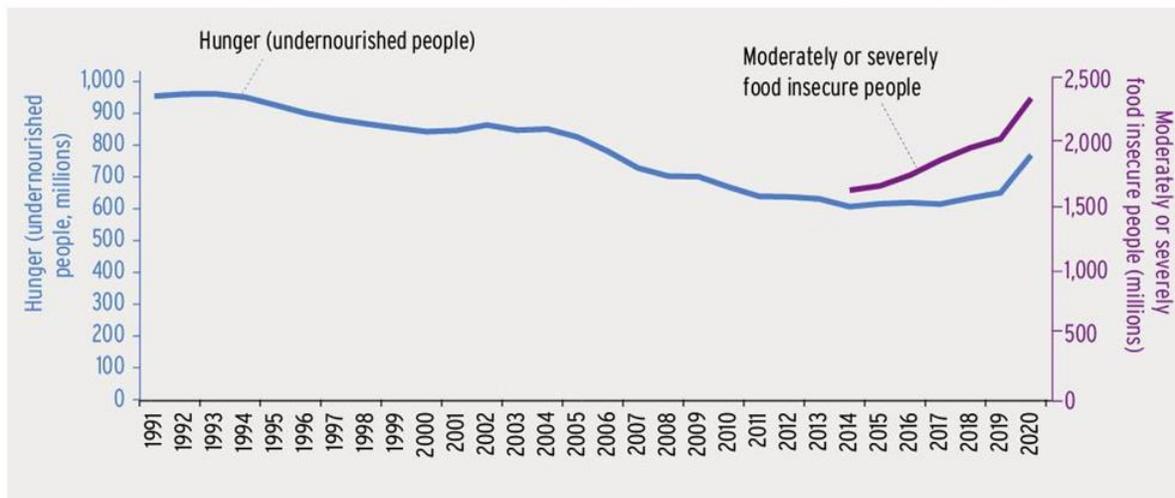
2. Dangerous planetary trends: climate change and food security

2.1 Food insecurity is on the rise

Since the last part of the 20th century, the norm was the progressive reduction in food insecurity in the world. This changed around 2015. Consistent data for undernourishment (typically considered a proxy for ‘hunger’) reflects this increase: people affected by hunger went from 607 million in 2014 to 768 million in 2020. While the COVID-19 greatly is responsible for most of the increase, the increasing trend was already in motion, with the addition of 43 million people in 2015-2019. Taking a broader definition of food insecurity the upward trend also appears even stronger before the pandemic: the number of people moderately or severely food insecure increased by 400 million in 2015-2019, and 320 million in 2020 (see figure 2).³

Figure 2

After decades of improvement, food insecurity started to rise (even before COVID-19)



Source: UNDP (2022), based on FAO data.

The increase in food insecurity responds to multiple factors. The pre-COVID-19 increase is linked to both environmental and social processes. Climate change is playing a key role (as explained below), but the trend is also linked to the increase in frequency and intensity of conflict, and weak economic performance (FAO (Food and Agriculture Organization of the United Nations) 2020.).

2.2 This trend might continue because of climate change

In the coming decades, climate change is likely to pose further dangerous pressure on food security. Climate- and weather-related disasters have increased rapidly in the last couple of decades. In the 2010s, 360 distinct disasters occurred per year compared to around 100 disasters in the 1980s. The burden of these disasters is mainly faced by the agricultural sector. Changes in temperature and

³ Data from FAO and others 2021; FAO (Food and Agriculture Organization of the United Nations) 2021.

precipitation have changed the land quality and crop yield. Global surface temperature is projected to increase by 1.8C to 4C by the end of 2100. Since the climate is especially important for agriculture, intense and frequent extreme events pose not only a threat to the production and distribution of food but also to the livelihoods of a large number of people who are dependent on agriculture as their main source of income.

The global food production of the top 10 global crops has already been affected due to climate change which has led to a significant decrease in calorie intake, impacts are mostly negative in Europe, Southern Africa, and Australia but generally positive in Latin America. The impacts in Asia, Northern and Central America are mixed. This has led to approximately a 1 percent average reduction in consumable food calories in these ten crops (Ray and others 2019.) The smallholder farmers in a drier region are especially vulnerable to climate variability as they primarily depend on rain-fed agriculture (Niles and Brown 2017.) In sub-Saharan Africa, a large part of the population makes their living from agriculture, and agriculture is predominantly rain-fed. Therefore, variability in temperature, precipitation, and frequent natural disasters can be detrimental. According to a recent report by the World Meteorological Organization rainfall continues to be erratic in Southern Africa. Below normal rainfall is worsening the pre-existing drought conditions and delayed heavy rainfall is leading towards flooding in some areas. According to IPCC, projections suggest that the frequency and intensity of heatwaves will continue to increase through the 21st century and the highest number of people will be affected in Africa and Asia (Masson-Delmotte and others 2019.) Climate variability has reduced income and increased food insecurity in Ghana and Ethiopia where the majority are employed in the agricultural sector (Wossen and others 2018.) In south Asian countries such as Pakistan, India, and Bangladesh wheat, maize and rice yield has decreased due to an increase in temperature (Gupta, Somanathan and Dey 2017.) The Himalayan region is especially vulnerable because of rapid warming and increasing extreme events. This region is secluded and lacks proper infrastructure which makes climate change even more challenging (Wester and others 2019.) In addition to the reduction in agricultural yield climate change has also lowered the livestock growth rate in pastoral systems in arid and semiarid regions because of the impact on water availability, quality of forage, and biodiversity.

Climate change not only has an adverse impact on land, but it also causes significant changes in the oceans- increasing surface temperature, acidification, and rise of sea level. Countries that are heavily dependent on fisheries industries for protein intake and employment are exposed to high risks. In Africa, Cote d'Ivoire, Nigeria, and Togo are most vulnerable to rising climate-induced changes. Several Asian countries such as Bangladesh, Cambodia, Maldives, and Indonesia which are heavily dependent on fisheries for consumption and source of income are also vulnerable to climate change (Ding and others 2017.)

According to a recent report by FAO, in Africa, post-disaster production loss amounts to an annual dietary energy supply of 204,000 calories or 82 days of calorie intake, per capita per year. In Latin America and the Caribbean, crop and livestock production losses convert to an alarming average annual loss per capita of 355,000 calories or 142 days of calorie intake. Much of the loss is concentrated in higher-calorie commodities, such as milk and dairy, honey, oilseeds, and sugar crops There is also strong evidence that climate change will affect food quality and food prices (FAO 2021).

Research also shows that changing climatic conditions can initiate a vicious circle where the infectious disease causes or compounds hunger, which makes the affected populations more susceptible to infectious disease, which can lower the capacity to effectively use food. And Food-insecure people will be more likely to be adversely affected by extreme heat (Watts and others 2018.)

Climate change is also increasing inequality between the richer and the poorer countries. The richer countries located in temperate regions have benefitted as global warming increased annual economic growth but has substantially declined the annual economic growth of poorer countries with hot climate. This has resulted in exacerbated global inequality over the past half a century. Per capita gross domestic product (GDP) has been reduced 17–31 percent at the poorest four deciles of the population-weighted

country-level per capita GDP distribution, yielding a 25 percent larger gap between top and bottom deciles than in a world without global warming (Diffenbaugh and Burke 2019.)

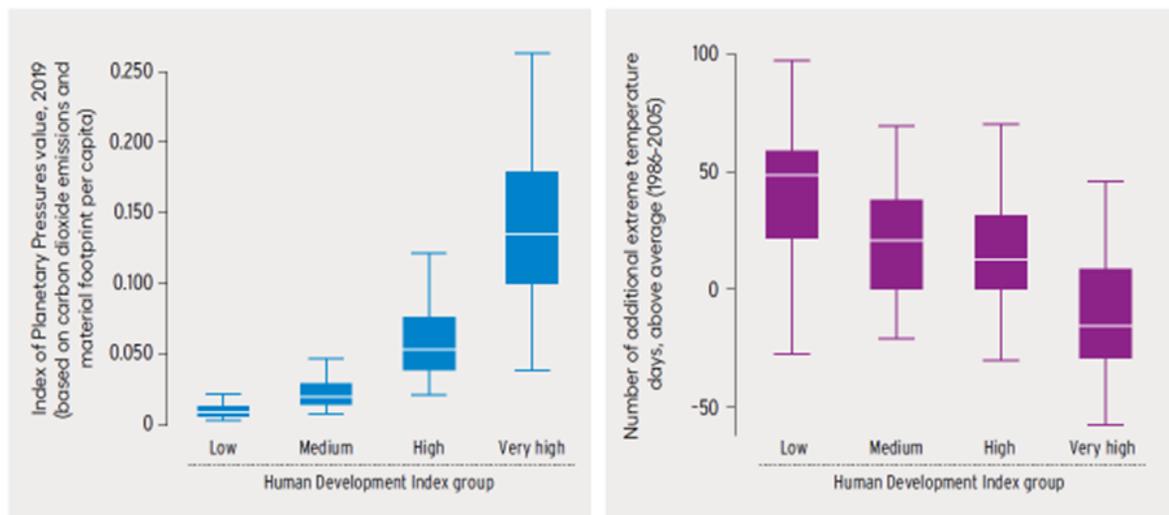
3. There is a destabilizing dynamic in motion

There is a destabilizing dynamic generating incentives for relative inaction. Often the problem of environmental sustainability is presented as a trade-off between the well-being of present a future generations. In the context of climate change, this trade-off is visible for the world as a whole. However, for the next few decades, it is not obvious for individual countries. On the side of the actions, the countries that today are responsible for higher emissions (those *benefiting* from the generation of dangerous planetary pressures), are the more developed countries (see panel A in figure 3). On the side of the consequences, the costs of climate change won't be paid by the whole world equally, these will be predominantly faced by the poorer countries (panel B in figure 3): while in countries with low human development there will be on average around 50 more days with extreme temperatures (in the RCP 4.5 scenario), in countries with very high human development there might be a reduction in the number of days with extreme temperatures.

While this analysis is based on a restricted set of hazards (extreme temperature days) and does not take into account the whole range of effects of climate change, including other direct and indirect effects to be bear by developed countries, it highlights the presence of system barriers to action, or incentives to inaction.

Figure 3

The destabilizing dynamic of climate change: More developed countries tend to capture more benefits from planetary pressures and less of their costs



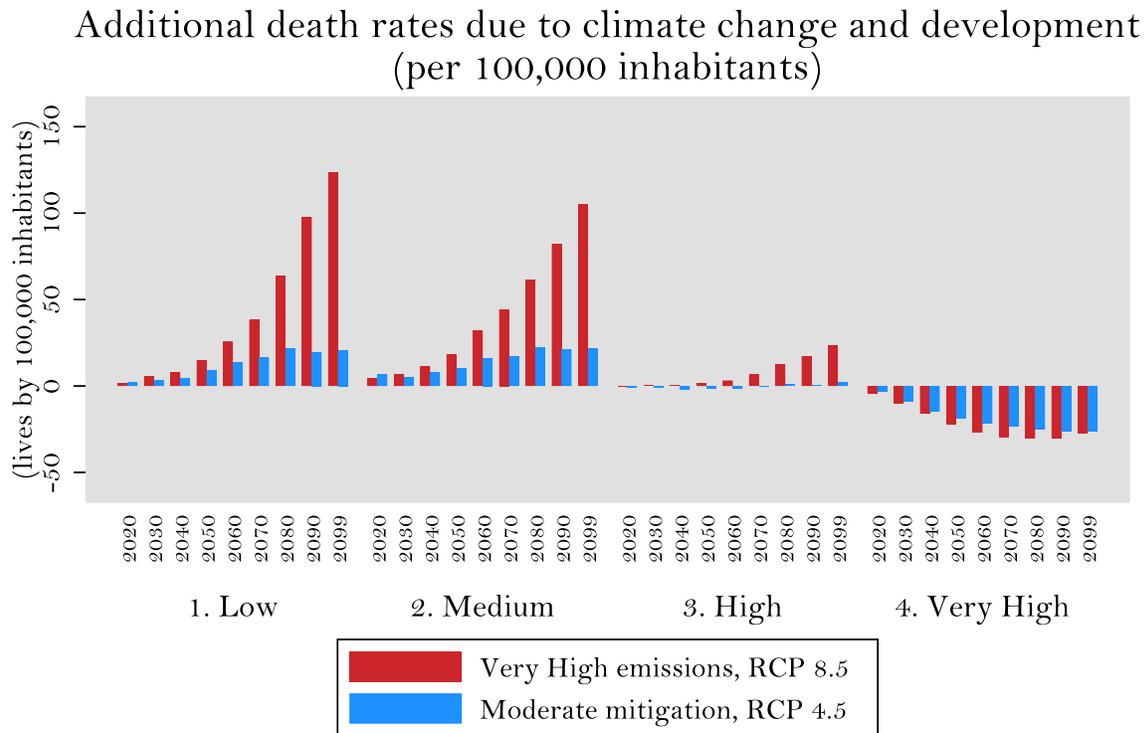
Source: Human Development Report Office based on Carleton and others (2020) and UNDP (2020).

Source: UNDP (2022), based on Carleton and others (2020) and UNDP (2020).

4. Pressures on multidimensional poverty are expected to rise, with a growing force

The preceding analysis also highlights the importance of moving beyond averages when analyzing the effects of climate change on people. Average global warming is masking the highly diverse realities around the world. Climate change will affect certain regions more than others: poorer countries –experiencing more additional extreme temperature days—are expected to face greater increases in mortality (Carleton and others 2020.). And the gaps in these direct effects are expected to grow over the rest of the 21st century. Climate change is expected to intensify deprivations and inequalities (figure 4).

Figure 4

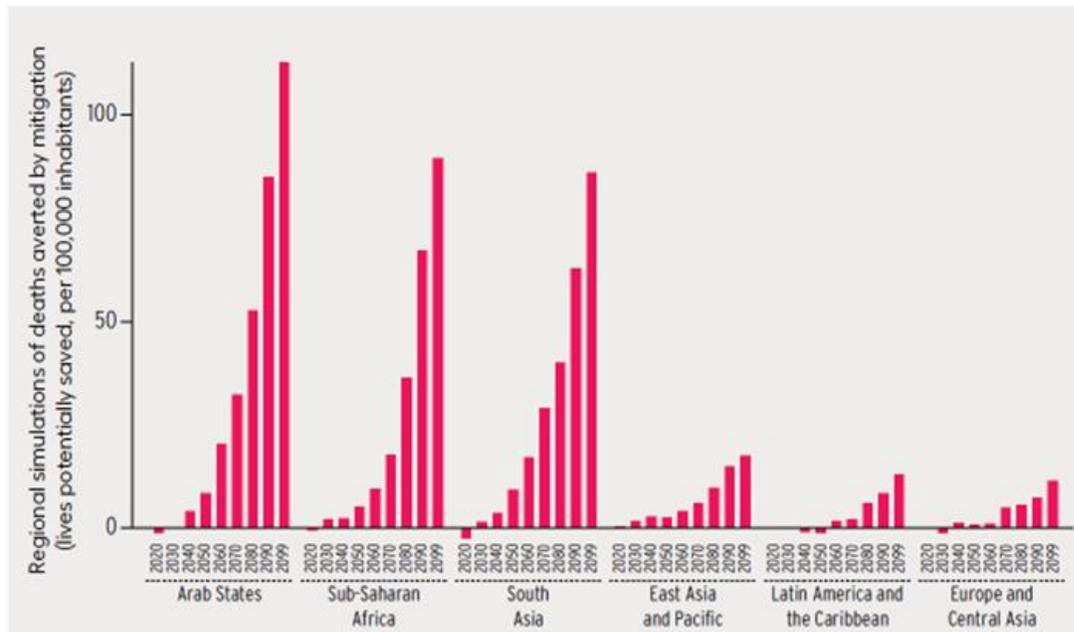


Source: HDRO based on Carleton and others (2020).
Weighted by population.

As the more intense effects of climate change will be realized towards the end of the century, timely action can save lives and contribute to curb inequalities. For instance, a decisive move towards the reduction in carbon emissions can avert most part of the effects on people’s mortality. Developing regions, like Arab States, Sub-Saharan Africa and South Asia will benefit the most (figure 5).

Figure 5

Mitigation can save lives, in particular in developing regions



Note: Comparisons are between Representative Concentration Pathways 4.5 and 8.5. Aggregates are weighted by population.

Source: UNDP (2022), based on Carleton and others (2020).

5. The way forward

In this paper, we have described that the world might be at the onset of a new persistent cycle of food insecurity and multidimensional deprivations, linked to the Anthropocene context. The underlying forces are in motion. It is critical to mobilize actions to avoid the realization of this plausible scenario.

Efforts addressed to curb climate change should be a priority. Many lives depend on our collective timely action. Initial estimates indicate that around 150 million people could be saved from dying from changes in temperatures over the rest of the 21st century (most of them in developing countries), through mitigation –severely cutting greenhouse emissions in line with the Paris Agreement.

However, this is not enough. Even with moderate mitigation, 40 million people are estimated to die because of changes in temperatures during the rest of the 21st century. Therefore, it is essential to mobilize efforts to enhance adaptation capacities in developing countries and across the most vulnerable regions within countries.

Moreover, it is essential to use the human security lens to understand that in this highly interconnected world insecurities propagate fast, from country to country, and from one dimension of development to other dimensions of development: the dynamics of health and nutrition, education, work, the economy, management of nature are deeply interconnected in the face of shocks. This requires systemic responses beyond silos and enhanced solidarity (see UNDP (United Nations Development Programme) 2022.)

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