



## **Risk of reversal in progress on world hunger as climate change threatens food security**

### **SUMMARY**

New evidence of how climate change could damage food security was presented today in a major new scientific report by the Intergovernmental Panel on Climate Change (IPCC).

The report is clear: the impacts of climate change on food are worse than previously estimated. The last time the IPCC reported in 2007 they gave mixed messages about positive impacts of climate change on crops in some parts of the world possibly offsetting negative impacts elsewhere. This report is categorical: climate change has already meant significant declines in net global yields of key crops like wheat and maize, and the picture is set to get much worse at the same time as demand for food increases. Urgent adaptation action is vital if we are to eradicate hunger within the next decade, but unless greenhouse gas emissions are also reduced rapidly now, climate impacts may surpass adaptation limits after 2050, threatening large human civilisations.

This briefing summarizes some of the key findings in the IPCC Working Group II report with regard to climate impacts on food and hunger. To prevent a reversal in progress on ending world hunger, Oxfam is calling on governments, business and publics across the globe to take action for zero hunger and a safer climate, so that we, our children and families around the world have enough to eat, always.

### **Highlights of IPCC AR5 Working Group II report on food security and hunger<sup>1</sup>**

Climate change is already with us and impacts are already visible on food security – both on net global food production and availability, and also on food prices and access:

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<sup>1</sup> Updated based on IPCC WGII (AR5) adopted final report and tables, issued March 31, 2014.

- The IPCC concludes (with "high confidence") that "the effects of climate change on crop and food production are evident in several regions of the world"<sup>i</sup>.
- Contrary to the suggestions in 2007's AR4 that climate change would be good for crops in high-latitude regions, possibly offsetting negative impacts elsewhere, the IPCC's AR5 concludes that already "negative impacts of climate change on crop yields have been more common than positive ones"<sup>ii</sup>, and that even in high latitude regions "it is not yet clear whether the balance of impacts has been negative or positive in these regions"<sup>iii</sup>.
- Most strikingly, the IPCC find that "climate change has negatively affected wheat and maize yields for many regions and in the global aggregate"<sup>iv</sup> over the decades since the 1960s.
- It also states that "climate extremes" were a factor behind recent global food price spikes, and that "several of these climate extremes were made more likely as the result of anthropogenic emissions"<sup>v</sup>. This is the first time the IPCC has drawn a link between climate change and food prices.

More severe impacts on food security are likely to be felt within the next two decades – much sooner than previously thought:

- Without adaptation, climate change is projected to negatively impact production of major crops (wheat, rice and maize) in both tropical and temperate regions, for local temperature increases of just 2°C above late 20<sup>th</sup> century levels (NB a local temperature increase of 2°C represents a much lower global average temperature increase)<sup>vi</sup>.
- The previous IPCC report (AR4) said: "Globally, the potential for food production is projected to increase with increases in local average temperature over a range of 1–3°C, but above this it is projected to decrease."<sup>vii</sup>
- 75% of the available studies suggest yield declines of up to 50% from the 2030s<sup>viii</sup>, with an increasing proportion of studies indicating increasingly negative impacts in the decades thereafter, and all "in the context of rapidly rising crop demand"<sup>ix</sup>.
- The IPCC now considers it "very likely" that climate impacts "will lead to increased food prices by 2050, with estimated increases ranging from 3–84%"<sup>x</sup>.

After 2050, current emissions trends could lead to impacts that will surpass our capacity to adapt, raising substantial risks to food security:

- The IPCC states with high confidence that "Global temperature increases of approximately 4°C or more above 20<sup>th</sup> century levels, combined with increasing food demand, would pose large risks to food security globally and regionally"<sup>xi</sup>
- "Because crops have an absolute physiological limit on thermal tolerance, there is a ceiling beyond which no further adaptation to global warming is possible: the IPCC states that the "production of the staple crops maize, rice, wheat and soybean is generally assumed to face an absolute temperature limit in the range of 40–45°C", while key growth stages such as "sowing to emergence, grain-filling, and seed set have maximum temperature thresholds near or below 35°C"<sup>xii</sup>.
- Further "limits to adaptation" occur "where crop yields drop below the level required to sustain critical infrastructure such as sugar or rice mills. In some cases, these can be effectively irreversible."<sup>xiii</sup>
- The IPCC notably concludes that the existence of "critical climatic thresholds... suggests that there may be a threshold of global warming beyond which current agricultural practices can no longer support large human civilizations<sup>xiv</sup>".

This means that without urgent action, progress in the fight against hunger will be reversed:

- The IPCC cites studies which project "an increase in global malnourished population by 49 million (11%) in 2050", depending on whether CO<sub>2</sub> fertilisation effects increase crop yields above baseline<sup>xv</sup>.
- Children under 5 in developing countries would be hit particularly hard. Studies cited by the IPCC project "climate change by 2050 would increase the number of undernourished children under the age of 5 by 20–25 million (or 17–22%)" while severe stunting (due to malnutrition at young age) was projected to "increase by 23% (central Africa) to 62% (South Asia)"<sup>xvi</sup>.

- Although progress is being made towards reducing child malnutrition, climate change threatens to reverse this. The IPCC cites research concluding that "climate change would hold back efforts to reduce child undernutrition in the most severely affected parts of the world, even after accounting for the potential benefits of economic growth"<sup>xvii</sup>.
- The IPCC concludes that "climate change will have a substantial negative impact" on per capita calorie availability; childhood undernutrition and undernutrition-related child deaths in developing countries<sup>xviii</sup>. This is a far stronger and more worrying conclusion than in IPCC AR4 in 2007.

It is not too late to act, but we must overcome major deficits in adaptation and preparedness to cope with climate impacts on food in the near-term, and rapidly cut greenhouse gas emissions to reduce the risk of climate change to food security in the second half of the century:

- The IPCC recognises for the first time "a gap between global adaptation needs and the funds available"<sup>xix</sup>, and elsewhere cites various estimates of global adaptation needs, the most recent of which is the World Bank's estimate of \$70-100 billion per year.<sup>xx</sup>
- The IPCC states that reducing CO<sub>2</sub> in the near term can "substantially reduce the risks of climate change in the second half of the 21st century", including the risks of "negative agricultural yield impacts, of water scarcity, major challenges... from sea level rise" and impacts from "heat extremes, floods and droughts" and that the risk of crossing "tipping points" or "critical thresholds... in the earth system or interlinked human and natural systems decreases with reduced greenhouse gas emissions"<sup>xxi</sup>.

## How do we stop climate change making people hungry?

Despite the mounting threat of climate change, hunger is not inevitable. Oxfam is calling for the following urgent action by governments, business and individuals to stop climate change making people hungry:

- Governments and business must respect, protect and fulfil the right to food in a warming world, and help build people's resilience to hunger and climate change. Rich country governments must deliver on their promises to help the world's poorest and most vulnerable countries. Poor countries' adaptation needs are estimated to be around \$100bn a year - equivalent to just five per cent of the wealth of the world's richest 100 people.
- Governments and business must slash greenhouse gas emissions. Governments must commit to fair and deep cuts in emissions which keep global temperatures below 1.5 degrees of warming. Business must also cut their emissions – for example the food and drink industry should take suppliers to task who recklessly cause deforestation and banks should shift finance away from fossil fuels and into sustainable, low carbon alternatives.
- Governments must secure international agreements that tackle climate change and hunger - including a fair, ambitious and legally-binding climate change agreement at the UN in 2015. They must also support a target of zero hunger by 2025 and climate change targets in the UN post-2015 development framework.
- We can take action into our own hands and insist that governments and companies act to stop climate change making people hungry, at [www.oxfam.org/foodclimatejustice](http://www.oxfam.org/foodclimatejustice), and make choices about the way we live our lives, including cutting food waste, reducing meat consumption and asking our favourite food brands to act responsibly.

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## Notes

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- i Executive Summary, Chapter 7 of IPCC WGII AR5, 2014: Food Security and Food Production Systems
- ii Section A1, Summary for Policy Makers, IPCC WGII AR5, 2014
- iii Ibid.
- iv Ibid.
- v Executive Summary, Chapter 7 of IPCC WGII AR5, 2014: Food Security and Food Production Systems
- vi Section B-2, Summary for Policy Makers of IPCC WGII AR5, 2014
- vii Executive Summary, Chapter 5 of IPCC WGII AR4, 2007
- viii Figure SPM7, Ibid.
- ix Section B-2, Summary for Policy Makers of IPCC WGII AR5, 2014
- x Section 7.4.4, Chapter 7 of IPCC WGII AR5, 2014: Food Security and Food Production Systems
- xi Section B-2, Summary for Policy Makers of IPCC WGII AR5, 2014
- xii Section 11.8.2, Chapter 11 of IPCC WGII AR5, 2014: Human Health - Impacts, Adaptation and Co-Benefits
- xiii Section 7.5.1.3, Chapter 7 of IPCC WGII AR5, 2014
- xiv Section 11.8.2, Chapter 11 of IPCC WGII AR5, 2014: Human Health - Impacts, Adaptation and Co-Benefits
- xv Section 7.4.4, Chapter 7 of IPCC WGII AR5, 2014: Food Security and Food Production Systems
- xvi Ibid.
  
- xvii Section 11.6.1.2, Chapter 11 of IPCC WGII AR5, 2014: Human Health - Impacts, Adaptation and Co-Benefits
  
- xviii Ibid.
  
- xix Section C-1, Summary for Policy Makers of IPCC WGII AR5, 2014
  
- xx Chapter 14 of IPCC WGII AR5, 2014: Adaptation Needs and Options
  
- xxi Summary for Policy Makers of IPCC WGII AR5, 2014: Food Security and Food Production Systems

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