

# IPCC ON THE IMPACTS OF CLIMATE CHANGE:

## More Poverty, Less Food

### Highlights of the IPCC AR5 Working Group 2 Report

**THE RELEASE** of the Intergovernmental Panel on Climate Change Report on Impacts, Adaptation and Vulnerability (“IPCC AR5 WGII”) warns of the grave consequences of climate change. The report outlines that as little as 1°C of warming could be devastating to food production and crop yields and that higher levels of warming will push millions into poverty, reducing any development gains of the recent past.

The impacts of climate change are now unavoidable and will require human communities to adapt to a ‘new normal’ – this adaptation requires drastically more resources than currently available and a paradigm shift in our policies and approaches. Importantly, if we do not reduce emissions and get off our current pathway there will be many impacts to which adaptation is not possible, resulting in increasingly widespread poverty and hunger.

#### **Impacts of Climate Change are Happening Now**

The IPCC report released this week confirms that climate change is happening, and that most of the change has been caused by human emissions. It also confirms that the impacts of climate change – the changes in natural systems due to more heat and more greenhouse gases in the system – are already happening now.

The report outlines how climate change impacts are already happening in many regions of the world, with:

- changing rainfall patterns and melting snow and glaciers affecting water resources and quality;
- higher temperatures having widespread negative impacts on crop yields and farming, in particular steady declines in maize and wheat yields in temperate regions;
- recent warming contributing to the extinction of many species, such as amphibians in Central America.

Worst of all, the report concludes that climate-related threats are a particular burden to people living in poverty.

It says climate hazards often negatively impact the livelihoods of those living in poverty – directly through loss

of their homes and reduced crop yields or indirectly with rising food prices and resulting food insecurity -- pushing them into an even more precarious existence.

#### **More warming (more than 1°C) means worse and more impacts**

The report warns that impacts will worsen as temperatures rise and threaten people everywhere. It predicts, for example, that without adaptation “hundreds of millions of people will be affected by coastal flooding and displaced due to land loss.” The majority of these people will be in Asia.

Globally it finds that increasing climate change risks include:

- Death, injury, and disrupted livelihoods in low-lying coastal zones and small island developing states, due to sea-level rise, coastal flooding, and storm surges;
- Food insecurity and the breakdown of food systems linked to warming, drought and rainfall variability particularly in regions that are characterized by poorer populations in urban and rural settings;

- Loss of rural livelihoods and income;
- Severe harm for large urban populations due to inland flooding;
- Loss of both marine and terrestrial ecosystems and the ways they contribute to many peoples' livelihoods;
- Systemic risks due to extreme events leading to breakdown of infrastructure networks and critical services;
- Mortality, morbidity, and other harms during periods of extreme heat, particularly for vulnerable urban populations;
- Reduction of raw water quality and risks to drinking water quality and quantity. Each degree of warming is projected to decrease renewable water resources by at least 20% for an additional 7% of the global population.

## **The 2°C temperature goal is actually dangerous**

The report throws into question a widely held assumption that somehow 2°C represents a 'safe' limit for warming.

The report finds that forests are even more sensitive to climate change than previously thought, with "high risk of abrupt and irreversible regional-scale change ... leading to substantial additional climate change."

Forests are severely threatened by direct climate impacts like increased temperatures, drought, and windstorms, as well as forest fires and pest and disease outbreaks indirectly related to climate change. As forests die, they release previously stored carbon as carbon dioxide, thus driving even more climate change and pushing up temperatures higher than predicted.

The serious risk of carbon escaping from trees as they die of climate change induced causes also calls into question the long-term value of forests and soils as mitigation strategies.

## **Threatening Food and Farming**

The report warns of particular risks to farms, food production and food security, again bringing into question the widely held assumption (in the North) that 2°C is an acceptable and safe temperature limit. A world of 2°C of warming may be one of significant hunger and it may arrive sooner than we thought.

The report finds that "without adaptation, local temperature increases of 1°C or more above preindustrial levels are projected to negatively impact yields for the major crops (wheat, rice, and maize) in tropical and temperate regions."

It continues that, "with or without adaptation, negative impacts on average yields become likely from the 2030s ... and after 2050 the risk of more severe impacts increases."

As global average land and ocean temperatures are already estimated to have risen 0.85°C above preindustrial levels, the impacts of yield decreases due to climate change will be felt in the very near term.

Crop yields are particularly sensitive to extreme high day-time temperatures above 30°C. The report confirms there have already been yield decreases of 1-2% per decade in temperate wheat and maize. It specifically finds that half of the wheat-growing area of the Indo-Gangetic Plains could become significantly stressed by the 2050s.

It predicts the "loss of rural livelihoods and income due to insufficient access to drinking and irrigation water and reduced agricultural productivity, particularly for farmers and pastoralists with minimal capital in semi-arid regions."

These major impacts in rural areas will be felt in the near-term (2030-2040) and beyond through impacts on water supply, food security, and agricultural incomes. The report finds that, "price rises ... have a disproportionate impact on the welfare of the poor in rural areas" and there is an "increased likelihood of under-nutrition resulting from diminished food production in poor regions."

Similarly (in cities or rural areas), the report finds that it is wage-labor dependent households that will "be particularly affected due to food price increases, especially in regions with high food insecurity and high inequality (particularly Africa)."

Of course these shocks, disruptions, and risks will not be shared equally. The report concludes that "price rises, which may be induced by climate shocks as well as other factors, have a disproportionate impact on the welfare of the poor in rural areas, such as female-headed households and those with limited access to modern agricultural inputs, infrastructure, and education."

## **Threatening Fisheries and Food Security of Coastal Populations**

The risk to farms and crops will not be the only driver of hunger and food shortages in a world affected by climate change.

The report warns of the "risk of loss of marine ecosystems" and their contribution to "coastal livelihoods, especially for fishing communities in the tropics and the Arctic."

It predicts that "large and irreversible shifts" will cause the number of marine species to decrease at tropical latitudes with "implications for food security" and that a "large fraction of terrestrial and freshwater species faces increased extinction risk."

## Key Risks By Region (from Table 1)

### North America

- Wildfires increasing loss of life, property and ecosystem integrity
- Heat related human mortality
- Health, property, water quality impairment and ecosystem damage from floods

### The Ocean

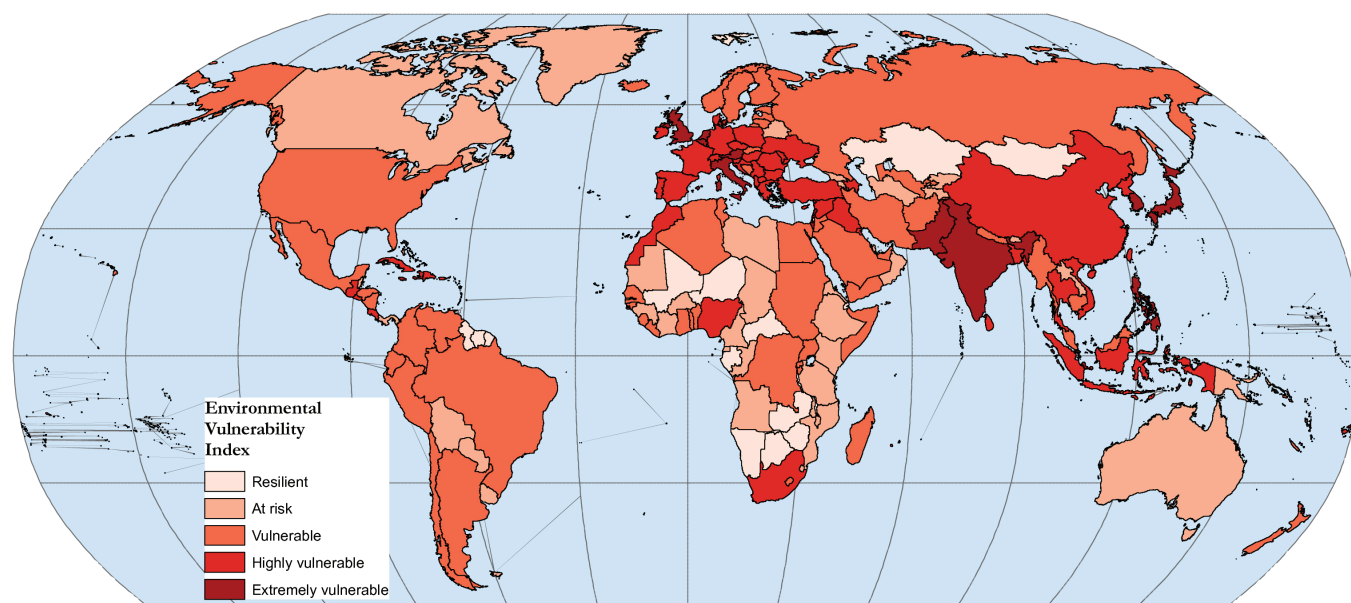
- Distributional shift in fish species and decrease in fishery catch potential in the tropics
- Reduced biodiversity, abundance of fisheries and protection from reefs (due to mass coral bleaching)

### Europe

- Increased losses of lives and property to flooding
- Significant reduction in water availability
- Increased impact from extreme heat events including on lives, crops, and air quality

### Asia

- Increased flooding
- Increased risk of heat related mortality
- Increased risk of drought related water and food shortage causing malnutrition



Projection: Robinson

### Small Islands

- Loss of livelihoods, coastal settlements and infrastructure
- Continued existence of low lying coastal areas

### Central and South America

- Water availability to decrease in semi-arid and glacier melt dependent regions
- Flooding in urban areas
- Decreased food production and food quality

### Africa

- Compounded stress on water resources
- Reduced crop productivity with strong adverse impacts on food security
- Changes in incidence and geographic range of vector and water borne diseases

### Australasia

- Significant change in composition and structure of coral reefs
- Increased frequency and intensity of flood damage
- Increased risk of coastal infrastructure

MAP SOURCE: NASA-SEDAC (<http://sedac.ciesin.columbia.edu/downloads/maps/cesic/cesic-environmental-vulnerability-index-2004/environmental-vulnerability-index-2004-global-thumbnail.jpg>)

Ocean acidification from increasing carbon dioxide concentrations poses serious risks for shellfish and reef-building corals, with potential consequences for coastal ecosystems, fisheries, and livelihoods dependent on those ecosystems and fisheries. The report warns that impacts of ocean acidification “will affect marine ecosystems for centuries if emissions continue.”

These impacts on aquatic ecosystems, along with an increase in extreme events and sea level rise, “will have adverse consequences” for the world’s 36 million fisherfolk, including by “changes in fish stock distribution and abundance, and destruction of fishing gear and infrastructure in storms and severe weather events.”



## Driving Poverty

In addition to threatening the right to food of millions, the report predicts climate change impacts will have dire implications for equality and the freedom from want.

It unequivocally states that “climate change will create new poor between now and 2100, in low-, medium-, and high-income countries and jeopardize sustainable development.”

It predicts that “throughout the 21st century, climate change impacts will slow down economic growth and poverty reduction, further erode food security, and trigger new poverty traps, the latter particularly in urban areas and emerging hotspots of hunger.”

It singles out the rural and agricultural sector of Africa, dominated by smallholder farming, and urban and rural regions in Southeast Asia, as facing “very significant” impacts to economies and livelihoods.

## Adapting to climate change to cost much more than \$100 billion

Some of these climate impacts can be prepared for and their risks reduced. The report notes that “available strategies and actions can increase resilience across a range of possible future climates while helping to improve livelihoods, social and economic well-being, and environmental quality.”

However the effectiveness of such approaches is highly variable. Indeed, the report notes that “underestimating the complexity of adaptation as a social process can create unrealistic expectations.” It notes that “climate-resilient development pathways will have only marginal effects on poverty reduction, unless structural inequalities are addressed and the needs for equity among poor and non-poor people are met.”

The report also calls attention for the first time to existence of both soft and hard limits to adaptation. With hard limits “there are no reasonable prospects for avoiding intolerable risks.”

Therefore, the report finds that “mitigation of greenhouse gas emissions over the next few decades can substantially reduce risks of climate change in the second half of the 21st century,” and reduce the likelihood that limits to adaptation will be exceeded. “Greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits.”

The report highlights that “global adaptation cost estimates are substantially greater than current adaptation funding and investment... suggesting a funding gap and a growing adaptation deficit.” It also finds “low confidence”

in estimates that global adaptation costs are as low as \$100 billion per year, suggesting they are much higher.

On a smaller scale it also notes that a “lack of financial resources (in the form of credit) and physical resources (such as water and land) are major factors inhibiting adaptation for farmers in Africa and Asia.” It continues that “access to knowledge and information” are “more fundamental” barriers.

It proposes some ways of filling these adaptation deficits and overcoming these barriers including by involving local and traditional knowledge and ecosystem-based adaptation. The report finds that “insurance schemes, social protection programs, and disaster risk reduction may enhance long-term livelihood resilience among poor and marginalized people, if policies address multidimensional poverty.”

## Adaptation is Essential

Risks of climate change are real and growing – this fact has been reinforced by the latest release of the IPCC.

The report focuses on impacts and adaptation, and shows just who will bear the impacts of climate change most heavily – the poor and disenfranchised, and the billions who are dependent on climate-sensitive livelihoods directly involved in food production: rain-fed smallholder agriculture, seasonal employment in agriculture (e.g., tea, coffee, sugar), fishing, and pastoralism.

The immediate reduction of emissions of greenhouse gases is necessary to confront the climate crisis, but there can be no climate justice without addressing the needs of those already facing the impacts caused by historical emissions. Polluters who have caused the climate crisis must now pay reparations to ensure vulnerable communities can adapt to the climate impacts that are unavoidable, and to protect the right to food for all.

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