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Background briefing

Can we adapt to all current and future climate impacts?

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Contents

Key points

- Limits to adaptation exist; some are already being experienced and others will increasingly be reached in the future if stringent emissions reductions and concerted adaptation efforts are not delivered.
- Adaptation, mitigation and losses and damages must be equally addressed and in parallel to ensure a safe and just future for all.
- Information on limits to adaptation should be included in adaptation plans to support effectiveness of measures in the long-term.

There are limits to adaptation

If our greenhouse gas emission reduction goals appear too challenging, there may increasingly be a temptation to give up on mitigation and focus solely on climate change adaptation (which refers to measures that aim to reduce harms from current and future climate). Particularly for climate change impacts like sea level rise that we know have already been locked in for decades to come, it can seem unappealing to invest in mitigation if the benefits of it will not be felt in the short-term.

However, the existence of limits to adaptation—points beyond which adaptation is no longer possible and unavoidable losses and damages occur—makes a strong case against this argument. With intensifying global warming, limits to adaptation are increasingly being reached in both human and natural systems and result in further devastating losses and damages across the world.

To be clear, global efforts on both mitigation and adaptation have so far fallen far short of what is necessary: the UNEP's 2023 assessment of the "emissions gap" showed that there is a large difference between the proposals that countries have put in place to reduce their emissions and what is needed to meet the long-term temperature goal of the Paris Agreement. At the same time, there is a major "adaptation gap" on the ground, with $194-366bn per year of finance that is needed to implement adaptation priorities in developing countries.

Evidence of limits to adaptation

Limits to adaptation can be either economic, sociocultural or biophysical and are often categorised as either "soft" or "hard" in scientific literature.

Soft limits occur when adaptation actions are theoretically possible but in practice are not available due to the lack of finance or human capacity (or other similar reasons). For example, if a lack of funding means that cooling centres cannot be provided, heatwaves will result in greater levels of negative health impacts and deaths.

Hard limits are reached when no adaptation actions are possible. They tend to be easiest to identify in natural systems (such as species extinctions) but also occur in human systems, for example, when people are forced to change their livelihoods (such as farming or fishing) due to changing weather conditions and other climate impacts such as desertification or sea-level rise.

The IPCC's 6th Assessment Report concluded that, to date, there is evidence of soft limits being reached in some human systems and that hard limits have been reached in natural systems such as rainforests, coastal wetlands and mountainous regions. If global warming rises above the 1.5°C level, Small Islands may face hard limits posed by limited freshwater, making them uninhabitable. The loss of coral reefs will also pose hard limits for the income and livelihoods of coastal communities. And our bodies have physical limits too; at 1.5°C the risk of heat stress, heat mortality and reduced capacity for outdoor work can result in hard limits, especially in warmer regions of the world. At 3°C of warming, Mediterranean parts of Europe are projected to encounter hard limits relating to water management, exposing many people to water scarcity. Small Islands, Asia, Africa, and Central and South America generally report greater constraints and both hard and soft limits to adaptation according to a systematic review of limits to adaptation.

The IPCC also states that by addressing a range of mainly financial and governance constraints, soft limits can be overcome. Inequalities and poverty that often lead to soft adaptation limits, disproportionally affecting the most vulnerable groups, can be addressed to avoid the worst impacts from climate change. Socio-economic factors that are closely linked to soft adaptation limits can take a long time to improve and it is therefore important to start addressing them as soon as possible. With intensifying global warming, more and more limits are expected to be reached.

What happens when we reach limits?

If we do not effectively adapt to climate change or if hard or soft adaptation limits are reached, climate change will continue to cause significant harms – known as losses and damages - including the loss of lives, economic resources, and cultural heritage. These will only get worse if global temperatures continue to rise.

This underscores the point that – while adaptation is vital to deal with the impacts of a warming climate, and that much greater efforts to adapt to climate change are undoubtedly needed, a deep and rapid reduction in greenhouse gas emission is essential to limit warming levels and the resulting impacts, including losses and damages.

Even though we know that limits to adaptation are already being reached today, there is still a need to further understand and identify limits to inform appropriate and timely adaptation actions. Planners and decision-makers working at the local level at which adaptation is implemented, must use the latest available climate impact data for current and future climates to assess when limits to adaptation measures may be reached.

Authors and contacts

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Further reading

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