



University
of Exeter

Global Systems
Institute

Global Tipping Points

Tipping Points Policy Brief

Harmful tipping points in the natural world pose threats never before faced by humanity, while beneficial tipping points in societies can accelerate transformation to sustainability.

OVERVIEW

- Major tipping points are at risk of being crossed due to global warming right now, threatening the stability of societies around the world. This constitutes a global emergency. Yet there is no adequate governance of these threats.
- Approaches to decision-making need to adapt to facilitate transformational change in economies and societies in response to these threats. Crucial to achieving this are positive tipping point opportunities, where desirable changes in society become self-propelling.
- Unfortunately, in the time lag during which appropriate governance and action might be realised, destructive tipping points could still be triggered. This means that societies must urgently be made more resilient to minimise the vast and unequal harms.

Context

'Tipping points' are moments when something changes abruptly. Think about leaning back on a chair. You can do so until the chair abruptly falls backwards. That moment is the tipping point. The previous state – where you were balancing precariously – has been replaced by a new state: lying on the floor.

Tipping points exist in nature. For example, coral reefs are being stressed by climate change, which is making the water too warm. This stress could become so great that reefs enter a new state that leads them to die off. Tipping points also exist in our societies. For example, some renewable energy is now cheaper than dirty alternatives, a tipping point that is ushering in a new era of clean energy rollout.

The Global Tipping Points Report – the most comprehensive assessment of tipping points ever conducted – is being launched at COP28. The report was produced by an international team of more than 200 researchers, coordinated by the University of Exeter, in partnership with Bezos Earth Fund. It shows that tipping points present unprecedented threats but also opportunities to us all. The rest of this briefing explores these threats and opportunities in more detail.

Tipping points in the natural world pose threats never faced by humanity

These are called 'Earth system tipping points'. If they are triggered, this will severely damage our planet's life-support systems and threaten the stability of our societies. For example, the collapse of the Atlantic Ocean's great overturning circulation combined with global warming could cause half of the global area for growing wheat and maize to be lost. Triggering one of the 26 Earth system tipping points identified in the report could trigger another, causing a domino effect. Climate change is now so severe that major tipping points are currently at risk of being crossed today. These are:

- The runaway melting of Greenland and West Antarctic ice sheets
- The die-off of warm-water coral reefs
- The collapse of the North Atlantic subpolar gyre's circulation
- The thawing of permafrost regions

More tipping points are threatened in the 2030s when the world will likely exceed 1.5°C of global warming. Their effects will be transmitted and amplified throughout our globalised world. This will multiply crises in the same way that the COVID-19 pandemic caused cascading stress to societies and economic systems globally, with unequal and unjust consequences. For example, the collapse of ocean circulations could adversely impact global food supplies, leading to knock-on impacts for economic stability, geopolitical cohesion, and security threats.

These impacts could escalate to threaten the breakdown of entire economic, social, and political systems, triggering destructive tipping points in societies experiencing stresses beyond their ability to cope. Currently, there is no adequate global governance at the scale of the threats posed by tipping point threats. The world is on a disastrous trajectory.

Unfortunately, even with urgent global action, the triggering of some Earth system tipping points may be unavoidable. This is because climate change and nature loss have reached critical levels. Mitigating the impact would still be possible through reducing the vulnerability of populations. Stopping further tipping points is critical because each manifestation of a tipping point diverts attention and resources into disaster response, eroding some of our agency to tackle the underlying drivers. This increases the risk of triggering more Earth system tipping points, creating a vicious cycle.

Positive tipping points in societies can accelerate a transformation to sustainability

The scale and pace of action necessary to mitigate tipping point threats can be achieved, partly because similar tipping dynamics exist in societies, and can work in our favour. These positive tipping point opportunities can be exploited, whereby coordinated strategic interventions can lead to disproportionately large and rapid benefits that accelerate the transition of societies toward sustainability. This is already happening in some cases. For example, targeted actions have created economies of scale that are now propelling the rapid uptake of renewable energy worldwide, which has reached or exceeded cost parity with fossil fuel power generation.

One positive tipping point can trigger others, creating a domino effect of positive change. For example, as electric vehicles pass a positive tipping point towards becoming a dominant form of transport, this reduces the costs of battery technology. Lower-cost batteries in turn provide essential storage capacity to reinforce the positive tipping point to renewable power, which can trigger another tipping point in producing green ammonia for fertilisers, shipping, and so on. Many areas of society have the potential to be 'tipped', including politics, social norms, and mindsets. But these opportunities are not realised on their own. Governance is needed to enable this process and to ensure everyone can engage with and benefit from tipping point opportunities.

Implications for policy and recommendations

The existence of tipping points means that 'business as usual' is now over. Rapid changes to nature and society are occurring, and more are coming. If we don't revise our approaches to governance and policymaking, these changes could overwhelm societies as the natural world rapidly comes apart. Alternatively, with emergency global action and appropriate governance, collective interventions could harness the power of positive tipping point opportunities, helping navigate toward a thriving sustainable future. To do so, the report recommends that policymakers:

- 1. Phase out fossil fuels and land-use emissions now.** Tipping point threats underline the critical importance of the 1.5°C goal and mean decarbonisation should assume emergency footing.
- 2. Strengthen adaptation and loss and damage governance.** The impacts of tipping points will be severe and spatially uneven, so governance should be adjusted and resources increased.
- 3. Include tipping points in NDCs and the Global Stocktake.** These should assess collective progress towards preventing tipping points, addressing impacts, and triggering positive tipping points.
- 4. Coordinate policy efforts to trigger positive tipping points.** Action by coalitions can bring forward positive tipping points in politics, economies, technology, culture, and behaviour.
- 5. The UN Secretary General should convene a global summit on tipping points.** This should focus on a governance agenda. These threats should urgently feature on the agenda of the 2024 G20.
- 6. Deepen knowledge of tipping points and its translation into action.** Investment in improved scientific knowledge and monitoring is needed to convert knowledge into action.

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Access the Global Tipping Points Report here:
global-tipping-points.org

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