

Key Takeaways

Science on the Spree 2025

Heat, drought, heavy rain – How do we adapt to the consequences of climate change?

Background

Extreme weather events such as heat waves, droughts and heavy rain are becoming increasingly prevalent worldwide. 2024 was the warmest year ever recorded. For the first time, the global average temperature was 1.6 degrees above pre-industrial levels. Even an immediate halt to all greenhouse gas emissions would hardly be able to maintain the 1.5 degree target of the Paris Agreement. Climate protection alone is no longer enough – adaptation to climate change has become another important pillar of climate policy. Targeted and inclusive climate adaptation can improve both quality of life and social justice. At the third edition of Science on the Spree on 24th June 2025, experts discussed how sustainable, socially just, and financially viable climate adaptation measures can be designed and implemented, and what is needed to promote motivation and ensure long-term perspectives.

Panel

Dr. Jan-Niclas Gesenhues – Member of the German Bundestag | Alliance 90/The Greens

Dunja Kreiser – Member of the German Bundestag | SPD

Prof. Dr. Walter Leal – Environmental and Sustainability Scientist | HAW Hamburg & Manchester Metropolitan University

Dr. Britta Stöver – Economist | Energy and Climate Division, Institute of Economic Structures Research (GWS)

Prof. Dr. Hans von Storch – Climate Researcher | University of Hamburg & Ocean University of China

Moderation: Katharina Menne – Editor at Spektrum der Wissenschaft

Keynote speech: Dr. Beatrice John – Head of Programme Adaptation at adelphi

Discussion highlights

Need for adaptation

Hans von Storch warned that the public perception of extreme weather events does not always match the scientific data. Not every event can be attributed to climate change. For example, many people have the feeling that storms are increasing, but the data does not show an increase. Cold spells are less frequent than they used to be. Heatwaves, on the other hand, are measurably increasing in both duration and intensity. Heavy rain is also increasing in some regions, frequently causing severe damage. The Ahr valley disaster was exacerbated by changes in land use and development. Von Storch pleaded for a fact-based climate policy. At the same time, he emphasised that extreme weather – regardless of its cause – poses real dangers for which we need to prepare. The panellists agreed that better monitoring is needed across Germany in order to be able to assess the actual situation and risks more precisely, especially at regional level.

Health and psychological impacts

Walter Leal made it clear that climate change also has a massive impact on health, especially for older and chronically ill populations. Leal stressed the increasing burden of allergies and respiratory diseases and pointed out that mental health was also suffering. Many young people were particularly concerned about the climate crisis. Leal called for health protection to be a central component of any climate adaptation strategy – from urban planning to emergency preparedness.

Costs of climate change

Britta Stöver estimated the potential damage in the absence of adaptation in Germany at up to 700 billion euros by 2050. Targeted investments could reduce this to around 90 billion euros. However, many non-monetary costs, such as the loss of quality of life or biodiversity, can be hard to quantify in models. Increasing inequality is also often not visible enough. The food price increases caused by climate change disproportionately affect low-income households. In addition, Germany is also affected by climate impacts abroad through global supply chains, such as crop failures, over which it has only limited influence. Leal also highlighted the rising costs for the healthcare system.

Regional climate adaptation

The panellists agreed that climate adaptation primarily takes place at municipal level. Every region faces its own challenges. It is therefore crucial that regions know their own risk profiles and develop measures tailored to them. Dunja Kreiser emphasised that municipalities are often not sufficiently equipped in terms of personnel and funding to cope with these tasks. She called for financial resources to be made available in a targeted and unbureaucratic manner, for example disaster control. She mentioned specific adaptation measures such as storage channels for rainwater retention and the use of grey water in new development areas. Gesenhues highlighted the importance of measures like dyke realignment, renaturation projects and the critical examination of construction projects in vulnerable areas like the Ahr valley.

Role of business

In a live poll, the audience saw the economy as bearing the greatest responsibility for climate protection. Dunja Kreiser emphasised that companies were already doing a lot and showing great interest in sustainable business practices. Sustainability also offers a competitive advantage. However, the transition to renewable energies and the circular economy initially entails high upfront costs. The transformation of the economy must be accompanied politically, for example through investment programmes, subsidies and clear regulatory frameworks. Gesenhues emphasised that the economy must be made more accountable in order to contribute to climate adaptation. Voluntary action alone is insufficient, he said.

Global and individual responsibility

The panel also discussed Germany's role in global climate protection. They agreed that Germany could make an impact in other countries through innovation and technology transfer. Hans von Storch doubted that Germany's emission reductions would have a global impact. It is important that countries such as China or India perceive adaptation solutions as economically viable and socially appropriate for their country. The panelists emphasised that the 1.5 degree target constitutes a legally binding commitment for Germany under international law and that the country had a moral responsibility to lead by example. Germany must demonstrate that climate protection and prosperity are compatible. Dunja Kreiser underscored the importance of robust international agreements. Jan-Niclas Gesenhues called for international financial commitments to be kept, for example for climate adaptation in the Global South. These countries hardly contribute to climate change, but suffer disproportionately from its effects. Gesenhues stressed that focusing solely on individual behavioral change is insufficient. A supportive political framework is needed that enables sustainable behavior. Kreiser also advocated for better education and increased public participation to strengthen personal responsibility and create acceptance for measures. Science and politics should not only provide society with knowledge, but also communicate the urgency of adaptation measures and their positive effects in an understandable way. Such measures should not be associated with deprivation or crisis management, but with positive images of the ability to act and confidence.

Recommendations to policymakers

1. Establish reliable monitoring to record regional risks
2. Empower municipalities to plan and implement adaptation measures
3. Integrate health protection more firmly into climate policy
4. Safeguard social justice in both climate protection and adaptation
5. Support and enable economic transformation towards sustainability
6. Fulfil international responsibilities in climate adaptation and finance

Annette Doerfel

Editor for Life Sciences
Spektrum der Wissenschaft