

CLUSTER OF EXCELLENCE CLIMATE, CLIMATIC CHANGE, AND SOCIETY (CLICCS)







### **GERMANS CONSIDER CLIMATE CHANGE A SUBSTANTIAL THREAT**

More and more Germans consider climate change to be a threat. In a representative study supported by CLICCS, 77 percent of those surveyed rated climate change as a "substantial" or "very substantial" threat to Germany; in 2014, the number was 63 percent.

The nationwide telephone survey, which was conducted in the fall of 2022 under the leadership of Prof. Beate Ratter, involved more than 3,000 participants. According to the results, an impressive 81 percent now feel it is possible they will be personally affected by the impacts of climate change in their region; in 2014, the number was 69 percent.

This aspect is relevant for the required decarbonization of society. Citizens' individual climate behavior is a critical factor in whether – and if so, to what extent – they consider climate change to be a threat. Those who believe it could affect them personally are more likely to support climate protection measures or take steps to adapt.

"Climate change adaptation measures can reduce the risk of damage, but can also spark resistance," says Ratter, a geographer. "They are more likely to be supported when citizens understand the need for them. And part of that means they consider the threat to be something that could affect them



Analyzes the perception of climate change: Geographer Prof. Beate Ratter

personally; only then are they willing to take personal precautions." The study confirms that citizens' attitudes on their individual risk are to a considerable extent regionally influenced and depend on how visible climate change impacts are where they live, as well as their own recent experiences.

In 2014, storms (28%) and flooding (23%) were cited as the natural disasters with the greatest potential consequences for the respondents' home region. After several years of extremely dry conditions, blazing hot summers and forest fires, we now see a different picture: in 2022, droughts (27%) and heat waves (19%) were the new "top two." "Those who have experienced an extreme event in their home region don't feel as secure and tend to see climate change as a more pressing threat," says coordinator Ratter. The study confirms this, e.g. for the postal code region "5," which is home to the Ahrweiler district – where, in July 2021, the flooding in the Ahr Valley did tremendous damage and cost more than 130 lives. This had a direct effect on risk perceptions: unlike the rest of the country, in 2022 those surveyed there rated flooding (21%) as the greatest threat in their region.

Which age group feels most at risk? 79 percent of young people (14- to 29-yearolds) and those over the age of 60 consider climate change to be a "substantial" or "very substantial" threat. At 73 percent, the number is lowest among 30- to 44-year-olds. These generally high risk assessments can be used to determine which future social developments are plausible – the central research question CLICCS is pursuing answers to.

## **"UNITE BEHIND THE SCIENCE**

Calls to listen to the science can be heard at climate protests around the world. But what exactly does it mean? In a recent study, Prof. Simone Rödder and Christopher Pavenstädt have, for the first time, shown how climate movements refer to science in their communications. Based on analyses of German and US media, and of the movements' own documents from the year 2019, they took a closer look at *Fridays for Future* (FfF), *Extinction Rebellion* (XR) and *Sunrise*.

All three invoked science to legitimate themselves and positioned it similarly in their respective narratives: although research has shown that humans are responsible for climate change for some time now, the lack of political action has led to a crisis that threatens life on Earth.

They combine this vision of the future with demands for radical social change. However, whereas *Sunrise*'s goal is to achieve, through political struggle, effective climate and social policy as part of a Green New Deal, XR and FfF frame the climate as an issue that transcends party lines and calls for consensus. Their invoking science on the one hand, and



Which narratives do climate movements use – and how can they help transform society? The study addresses plausible climate futures, a central focus area for CLICCS. Pictured here: A Fridays For Future protest before the Federal Chancellery.

countless scientists invoking the movements on the other, serves to form a coalition of activists and researchers.

Interestingly enough, these climate movements evince little of the ambivalence seen in past environmental groups, which simultaneously relied on science and distrusted it. Rödder and Pavenstädt believe this could be due to the "IPCC effect": through its Assessment Reports, the Intergovernmental Panel on Climate Change has helped to present a unified scientific front, making it easier to integrate science into political discourse. https://doi.org/10.1093/scipol/scac046



# CLIMATE CHANGE THREATENS SHIFTING CULTIVATION IN INDIA

Through droughts and flooding, climate change is endangering harvests around the world. But what about regions where farming is difficult to begin with? A team of researchers led by Lea Schröder took a closer look at shifting cultivation in the Eastern Himalayas. In CLICCS, they are investigating what the sustainable farming of tomorrow could look like.

In shifting cultivation, a section of forest is cleared and burned, which fertilizes the soil with ash. After cultivating it for one or two years, the farmer moves on to a new field, while the old one is left to recover. The reason for this practice: the region's steep hills and nutrient-poor soils, which mean fields can't be cultivated for long.

Using a biophysical crop model, the team projected how climate change could affect soil erosion by the year 2100. "More intensive monsoon rain will wash away more of the fertile soil. The greater the global warming, the higher the erosion will be," says Lea Schröder.

She found that soil erosion could increase by more than 60 percent if the planet warms by 3 degrees Celsius as opposed to 1.5 degrees. In addition, the risk of soil erosion is higher in intensively farmed fields. This is particularly problematic in steep fields, where soil erosion is already high. https://onlinelibrary.wiley.com/doi/full/10.1002/ldr.4944

## **INVESTIGATING CLOUDS IN 3D**

On February 18, 2018, Winter Storm Friederike crossed Northern Germany with gale-force winds. The graphic shows the 6 pm forecast, based on data from the German Weather Service. The clouds' windspeeds range from yellow (ca. 30 m/s) to reddish-brown at higher elevations (ca. 60 m/s). The vertical markings (in blue) indicate the elevation.

The low-lying yellow belt of clouds to the right and just above the middle is particularly interesting. Here, the storm is moving fast from west to east and can potentially cause damage at ground level – an important information for weather warnings. In the upper right corner, the clouds move around the elevation indicator, the center of the storm.

But this graphic is only a snapshot. A team led by Thorwin Vogt has devel-

oped an innovative method for visualizing clouds in 3D. "It allows us to rapidly and interactively interpret cloud data on the computer. We can see much more than in static images, and intuitively find areas of interest," says Vogt.

The visualization method was integrated into the program Met.3D, freely available online. Coauthor Dr. Marc Rautenhaus explains the visualization in detail <u>on TV</u> (in German, from timestamp 7:14).



### **NEWS IN BRIEF**

#### **CLIMATE CHANGE ADAPTATION IS UNCOORDINATED**

It is above all individuals and households that are pursuing climate change adaptation – especially in the Global South. A comprehensive CLICCS metaanalysis shows that around the globe, different actors lack cooperation and measures continue to be largely uncoordinated.

https://uhh.de/cliccs-climate-adaption

#### WHEN PEOPLE TAKE PART IN CLIMATE PROTESTS

What determines your own participation in a climate demonstration? A study by CLICCS shows: Those who expect a large demonstration are less likely to go themselves. The Fridays for Future strategy therefore motivates more people. Instead of one central event, there are many local protests. https://uhh.de/cliccs-fff-protests

#### **SEA LEVEL IN MOTION**

When global warming increases, the sea level appears to fluctuate more strongly. Sri Nandini-Weiss et al. show this in a CLICCS study. Using climate models, the height of the sea level was recorded more accurately than previously possible.

https://link.springer.com/article/10.1007/s00382-023-06982-6

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