

# Natural flood prevention: Building higher trust through better communication

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2013 flood on the river Elbe near Dessau-Rosslau (Germany). Credit: André Künzelmann/UFZ

There have been repeated flood disasters in Germany in recent decades. For example, in 2002 and 2013 along the Elbe and in 2021 in the Eifel

region. As climate change progresses, severe floods are expected to occur more frequently. It is therefore important to quickly implement effective protection measures in vulnerable areas.

In the past, flood protection consisted mainly of technical solutions such as building dikes close to the river or constructing water retention basins. However, this is often no longer sufficient in order to be able to provide effective protection against flooding. Nature-based solutions such as dike relocation and floodplain renaturation are thus increasingly coming into focus in Germany and across Europe.

"The aim of such projects is to give the river more space so that it can spread out during flooding and the renaturalized floodplains can fully develop their water-absorbing effect," says Prof. Christian Kuhlicke, head of the UFZ Department of Urban and Environmental Sociology. "Natural flood prevention serves different purposes: It sustainably reduces the risk of flooding, restores the original state of the river landscape, increases biodiversity, and enhances the quality of life in the region."

However, the [local population](#) is often skeptical or critical of natural flood protection measures. For example, there are fears that they might not be as effective as conventional technical flood protection. The interventions in the landscape appear drastic, and there is uncertainty as to whether the landscape will change for the better. The sudden proximity to the widening river can also seem threatening.

"The relocated dike means that the water may get much closer to people's home during high water levels. The fact that the river is now more visible can be frightening, especially for those who have often been affected by floods. However, these new measures can actually make things safer than before," says Kuhlicke.

In their study, the UFZ team wanted to find out how people living near dike relocation areas perceive the natural flood protection measures and how well informed they feel. The research team interviewed 304 people from five towns and cities in Saxony-Anhalt on the Elbe (Lödderitz, Kühren, Aken, Rosslau, Vockerode), where measures for dike relocation or floodplain renaturation were carried out.

The researchers developed a questionnaire based on a new social science research model (PRAM model), which facilitates the comparability of the surveys. The questionnaire comprised 18 questions to which the participants were asked to indicate their level of agreement on a scale of 1 to 7.

For example: What is your attitude towards the dike relocation project? How powerless did you feel during this flood? I can completely rely on the public flood protection in my community. How likely do you think it is that a severe flood will occur in your community within the next five years?

"Our results show that both people who feel particularly connected to their home town and those who feel strongly threatened by flooding are more likely to oppose the measures. This was especially the case if these people had previously experienced a flood. In contrast, study participants who felt well informed and trusted local risk management were more likely to support nature-based measures," explains Dr. Sungju Han, a staff member at the UFZ Department of Urban and Environmental Sociology, former Ph.D. student at the University of Potsdam, and lead author of the study.

But what do the results mean for the planning of future flood protection projects?

"The fears and concerns of the population should definitely be taken

seriously. Better information and communication—ideally at the onset of the planning phase—can allay many fears," says Kuhlicke, who is the last author.

"It is particularly important to make it clear that natural flood prevention is primarily about effectively protecting the population from the effects of major floods. And that is through allowing more space for the river. All other effects—the more natural river landscape or the increase in biodiversity—are positive side effects but not the primary goal."

"If the population is not involved, there is often great resistance to [flood protection](#) projects. This is usually accompanied by considerable loss of time. And that can be dangerous—because you never know when the next [flood](#) will come," says Han.

The findings are published in the journal *Risk Analysis*.

**More information:** Sungju Han et al, A place-based risk appraisal model for exploring residents' attitudes toward nature-based solutions to flood risks, *Risk Analysis* (2023). [DOI: 10.1111/risa.14118](https://doi.org/10.1111/risa.14118)

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