

Indian drought risk, as Himalayan glaciers retreat

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Credit: Raphael Worni

Studying the retreat of glaciers in the Himalayas and its effect on monsoon, may lead to scientific recommendations. But the cultural barrier to change may be too high for local people to adopt them.

But by the time it began in May 2009, the original extreme urgency of the [HighNoon](#) project had 'melted' so to speak. Indeed, this EU funded project focuses on assessing the effect of [Himalayan glaciers](#) retreat on water distribution in [Northern India](#), as it may create [droughts](#). It also studies the possible consequences on the famous Indian summer monsoon. The urgency to study Himalayan glaciers stemmed from a

2007 International Panel on Climate Change (IPCC) [report](#)—later proven not only alarmist, but downright wrong—claiming that they would have disappeared by 2035.

Nevertheless experts think the project is anything but obsolete. "Quite the contrary," says Walter Immerzeel, a hydrologist at the University of Utrecht, the Netherlands, who conducted a somewhat similar but unrelated research in the [Himalayas](#), "It's very important and useful, if only because in the extreme Himalayan environment even fairly minor changes in temperature and [geographic location](#) can have mayor effects."

The main achievement of the project is that it "resulted in regional climate models at an unprecedented resolution and a strongly improved [monitoring system](#) for the amount of snow and ice in the Himalayas," points out project coordinator Eddy Moor, who is Head Climate Change & Adaptive Water management at Wageningen University and Research Centre in Wageningen, the Netherlands. The project team came up with a set of recommendations on how to deal with these changing glacier conditions, and how to prevent water shortages resulting from water melting from the glaciers, in the future.

Precisely because there are so many variables, it is very hard to pinpoint exactly how weather conditions and [water distribution](#) will change. But extreme rainfall and flood events are expected to increase after 2050, just like extreme drought. "Imagine what would happen if the monsoon pattern changes, and glacier smelt and monsoon don't coincide anymore," Immerzeel says, "These new refined regional climate models are very welcome [to understand what is likely to happen]." His own research demonstrates that the seasonal melting of glaciers, or smelt, is of very little consequence for the amount of water in rivers such as the Ganges. That is because the smelt season coincides with the Monsoon, making the Ganges mainly a rainwater river, unlike the Indus river, which is almost entirely fed by glaciers.

So how will the Northern Indian population benefit from this research? Some of the findings of the project are very practical. For instance, it recommends a different type of crop management—involving a change in the amount of fertiliser used, growing different plants, or planting them closer together—that can reduce the agricultural water usage by 30%.

But giving scientifically sound advice and getting people to take it, are two completely different things, especially in India. In the view of Anne van Urk, a hydraulic engineer who's spent most of his career on the Indian subcontinent, such advice will not work. "First, India is a deeply feudal society, so farmers will never change anything without asking permission to the landowner, or whoever they consider to be their superior," he explains, adding: "Second, the day to day problems of people in India are so enormous they can't possibly think of crises that may or may not arise in 50 years."

When it comes to water storage, the research clearly advises that a larger number of smaller storage basins would be more practical than a few very big ones. They fill up quicker, can be closer to the people, and they would also prevent the already very low groundwater levels dropping even further. Van Urk recognises that "while many small [water](#) storage basins are indeed a good idea, they are just not going to be constructed as long as people are more worried about what they're going to eat tomorrow." Immerzeel concurs: "a glaciologist is happy to just climb on top of a glacier and start measuring things with utmost precision. But for the farmer who lives downstream from an ever dwindling river that's just not enough."

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