

WHEN THE LEVEE BREAKS: ON PREPARING BETTER FOR WEATHER CALAMITIES

Relevant for: Environment & Disaster Management | Topic: Disaster and disaster management

The Kerala floods have been attributed to mismanagement of reservoirs, construction at sites that are off-limits, changes in land use patterns, destruction of forests and very heavy rain over weeks. Recently, other parts of the world too experienced extreme events. Sweden and Norway had a large number of wildfires that broke out with heat waves this summer. California has been ravaged by fire.

With the climate getting warmer, communities need to be prepared for an increase in the severity and frequency of prolonged heat waves causing dry conditions and fire, cyclones, very heavy downpours in short periods of time leading to flooding, and the failure of seasonal rains leading to droughts. But climate change does not appear with a legible calling card. Each of these events interacts with local conditions and activities to manifest a separate pattern of destruction. So, there may be landslides in hilly areas with little vegetation, severe flooding in homes built on lakebeds, flooded streets when storm water drains are not clear, breaking of levees, destruction of property and loss of life. The meteorological events may trigger the natural disaster, but they do not necessarily cause it.

The squeaky wheel gets the grease, or so the expression goes. Residents and decision makers look for immediate measures to contain or prevent similar events in future. Unfortunately, these efforts quite often turn out to be short-term actions that could worsen challenges in the long term. Studies by Sarah Anderson and colleagues show that such extreme events, which are high impact but have a low probability of occurrence, lead to managerial responses that may be ineffective, can be maladaptive, and may in fact result in worsening the problems.

For a shift in gear: on managing natural disasters

There are some lessons to be learnt from looking back at how extreme events were dealt with in the past and what the consequences were. The 2010 Pakistan floods were caused by unprecedented rainfall along with sudden changes in the flow location of the Indus, which occurred due to the breach of the Tori Bund, a levee built upstream to contain the river water. Similarly, the Kosi in Bihar temporarily changed its flow path in 2008 as a result of mismanaged response to earlier floods. The river brings a large amount of silt, which, along with the large volumes of water, led to a breach of the embankments and caused severe flooding in northern Bihar and parts of Nepal. These levees were built in response to earlier floods. In such situations, when a river is prone to avulsion, there should be plans to accommodate large periodic flows of water and sediment.

Responding for the long term often involves difficult choices by local people and decision makers, such as moving people out of flood plains or building homes that are designed to withstand flooding. Strengthening the engineering structures is not always the right solution. Short-term solutions demonstrate that some action is being taken, and they also match the political cycle of four to five years, but they do not generally take local ecology and the landscape into consideration and do not address long-term changes taking place as a result of climate change.

In another example, various new kinds of vector-borne diseases are rearing their heads and some of the older ones are reappearing due to changes linked with higher temperatures. But increased spraying with insecticides, a short-term measure, results in boosting resistance of the pest to the chemical spray. Scientists give the example of Boa Vista, in Brazil, where aggressive efforts launched after one patient was found to be infected with the dengue virus led to rapid and widespread increase in insecticide resistance in the region. Similarly, the approach taken by the U.S. Forest Service to suppress forest fire as a result of prominent fires in the early part of last

century had the inadvertent effect of making tree growth denser and more flammable. This most likely made subsequent fires more dangerous when they occurred in warmer temperatures.

For Kerala, the long-term decisions would include improving land use, so that much of the rain water can be absorbed, paying heed to recommendations for limiting development projects in the Western Ghats, especially in vulnerable areas, developing systems for integrated management of water including in reservoirs, designing emergency evacuation measures, and improving institutional mechanisms so that there can be an immediate and integrated response when there is unprecedented rain. When the risk of extreme events increases, people and governments are more likely to pay attention and respond to that risk through action. But making sure that the action is suitable for the short and also the long term is crucial.

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