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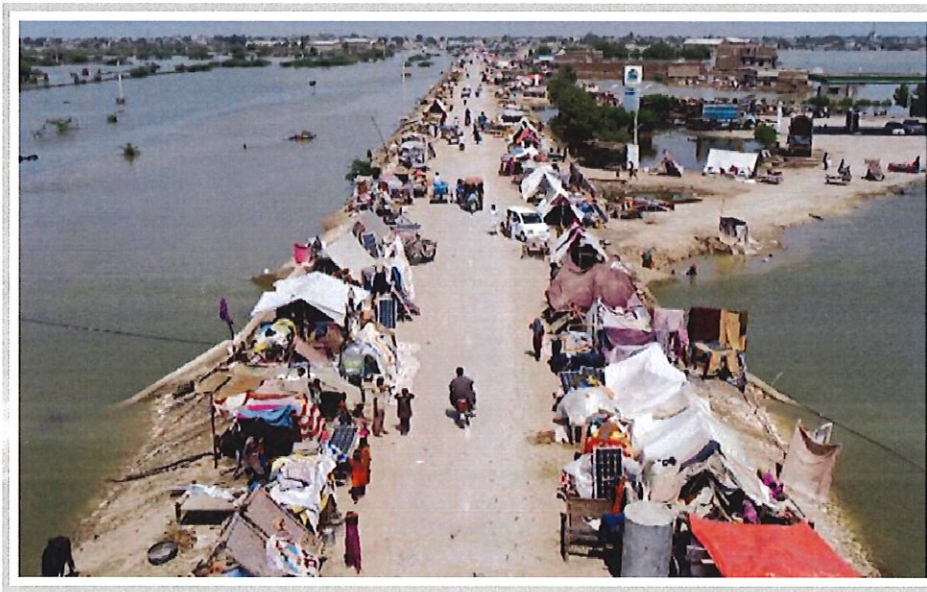
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02 September 2022

Pakistan is a hotspot for climate-driven human security crises



by David Spratt

A nation's capacity to respond to climate risks by adaptation is significantly dependent on its capacity, reflected in the nation's economic capacity, and poor countries are more vulnerable.

In Pakistan's case, that vulnerability is magnified by the extent of climate-driven change in the Himalayas and to the south Asian monsoons, as well as ever-more-extreme events: heat waves beyond human tolerance and flooding that has just submerged one-third of the country, killed up to 80% of livestock according to some reports, destroyed a million homes and 2200 miles of roads, and displaced more than 33 million people. "We are witnessing the worst flooding in the history of the country," said Dr Fahad Saeed, a climate scientist with the Climate Analytics group, who is based in Islamabad.

Pakistan is [ranked](#) eighth most at risk in the world by the Global Climate Risk Index, and climate change is having a particularly brutal impact:

Extreme heat: On 30 May 2017, the thermometer in Turbat, Balochistan hit 54°C, the hottest reliably measured temperature ever recorded in Asia. In May this year, at least a billion people experienced extreme temperatures in India and Pakistan as the two countries endured an unprecedented, record-breaking heat wave. Jacobabad in Pakistan reached 49°C, whilst Nawabshah hit 49.5°C. The extreme heatwave suffered earlier in 2022 was [made 30 times more likely](#) by global heating.

A 2020 study on extreme heat [found](#) that "over the coming 50 years, one to three billion people are projected to be left outside the climate conditions that have served humanity well over the past 6000 years", and that at 3°C of warming "near unliveable" extremes are projected to "envelop 1.2 billion people in India, 485 million in Nigeria and more than 100 million in each of Pakistan, Indonesia and Sudan". Another study from 2020 reached a [similar conclusion](#): warming of 2°C could provide more than 500 million people with additional incentives to emigrate, whilst warming of 3°C could provide additional incentive-to-emigrate to well over a billion people. In 2017, researchers [wrote](#) of "the likelihood of approximately half of the [world's] population exposed to deadly heat by 2050" (up from 14%), which "could pose existential risks to humans and mammals alike unless adaptation measures are implemented, such as providing air conditioning to the entire population or a massive relocation of most (sic) of the population to safer climates".

Extreme rain: Flood mitigation works have been developed over a long period of time to deal with monsoonal rains. But climate change has resulted in a 100-kilometre [spatial shift](#) westward in Pakistan's general monsoon

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pattern over the last three decades, drenching areas less prepared. A 2021 study found that climate change is [making](#) the south Asian monsoon more intense and more erratic. This year, parts of Pakistan have experienced about four times more rainfall than the 30-year annual average. In 2010, devastating floods affected one-fifth of the land area and 20 million people, destroyed 1.7 million homes, and damaged 5.4 million acres of arable land. Analysis of this event found that it was made more likely by climate change, as warmer oceans and Arctic heating destabilised the jet stream, a high-level wind that circles the planet. Enhanced meandering of the jet stream [led](#) to both the prolonged rain in Pakistan and an extreme heatwave in Russia that year.

Water crisis: Ironically, given the floods, Pakistan also faces a potable water crisis. Pakistan will face severe water scarcity by 2025 and is "one of the most water-stressed countries in the world" according to the World Bank, driven by changing snow melt from the Himalayan/Karakoram ranges, more variable monsoons, increases in population, inefficient drainage practices, a shift towards more water-intensive export cropping, and competing demands for water by the agriculture and power generation sectors. Pakistan's agricultural sector relies heavily on irrigation. 80% of agricultural land is irrigated (not rain-fed), the highest proportion in the world. Agriculture employs 45% of workers. Cotton, textiles and clothing make up half of Pakistan's exports. In quantitative terms, cubic yards of surface water available per person fell from 6,880 in 1951 to 1,358 in 2010. By 2025 it is projected to decrease to 1,046 cubic yards. Competition for water between the agricultural and power sectors is already intense and is likely to increase. Decreased flows in the Indus and decisions to allocate water to irrigation instead of power generation have been in part responsible for ongoing electrical blackouts. Power shortfalls in summer are up to half of demand, with power outages of up to 18–20 hours driving protests and increasing civil unrest.

Food crisis: Heavy rains in 2010 and 2019 caused devastating flash floods in Pakistan damaging crops and further reducing crop yields and increasing food insecurity. The country is one of 17 countries with a "very high-water risk," a list that includes hot and arid countries like Saudi Arabia. Fizza Dawood [reports](#) that: "As a result of changing monsoon patterns, disappearing glaciers, rising temperatures, and the frequency of floods and droughts, the country is already confronting climate-related challenges to its water supplies. The water deficit caused by harsh weather conditions is also projected to result in a food crisis in Pakistan, as agriculture area and yearly production are decreasing with each passing year."

Geopolitical tensions

Pakistan is vulnerable to large forces at work in the region, especially climate warming impacts on the vast glacial systems. A US National Research Council report on the potential impacts of climate change on water security in the Hindu–Kush Himalayan region concluded that changes in the availability of water resources may play an increasing role in political tensions, especially if existing water management institutions do not evolve to take better account of the social, economic, and ecological complexities in the region.

The Indus river system is the core of Pakistan's water system and most flow comes from Karakoram glaciers in its headwaters. There is evidence that glacial changes may be reducing river flows. The Karakoram glaciers have stable or increasing areas and possibly mass – with reduced melt flows – and are behaving differently from rapidly retreating eastern Himalaya glaciers.

The convergence of such climate and other risks results in compound security threats. Will the loss of the ice sheets (already well underway) in the Hindu Kush, Himalayan and Tibetan Plateau regions — where all the major rivers of Asia arise — exacerbate regional geopolitical tensions as water shortages in India, Pakistan and China become more critical and dam construction and control of rivers flowing from the Himalayan plateau through several nations become flashpoints?

China has 20% of the world's population but only 6% of potable water. There are long-standing border disputes between India, Pakistan and China, and all three are nuclear-armed. To the north-west, Central Asia, including Afghanistan, will suffer increasingly dire water insecurity, and internal displacement and regional conflict over water rights is possible in the strategic Central Asia zone that stretches to Iran. In Bangladesh, relatively small increases in sea levels will displace tens of millions of people, and India has surrounded the country with a formidable climate-security fence guarded by tens of thousands of troops; India faces the twin perils of unlivable heat and chronic water shortages, there has been a shift westward of the Indian summer monsoon, and rainfall has become more variable. South Asia has some of the world's largest cities and river deltas most vulnerable to inundation, as does China.

Pakistan may become a failed state, plagued by internal and neighbouring conflicts, acute water deficits, new heat extremes and a history of civilian society–military tensions. Pakistan is a pivot state between Central and South Asia. Salafist Islamist non-state actors play a significant role in conflict in Pakistan's immediate neighbourhood and within the country. Armed opposition groups target energy infrastructure. The military and intelligence have a powerful say in politics. The Pakistani state has a direct interest in wars in neighbouring Afghanistan and in disputed Kashmir, and it is nuclear armed.

Pakistan is a clear example of a country where the social and political landscape and susceptibility to climate harm are a potentially unstable mix.

Climate change is having a disproportionate impact on Pakistan, a country with low per capita greenhouse gas emissions. The causes are global and responsibility to act rests with those, including Australia, whose historical and high per-capita emissions are disproportionately responsible for the devastation across Pakistan.



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Carbon Monitor
global CO₂ emissions updates:
Jan-Aug of 2022 is +2.2 % than that of 2021, +11.6% of 2020 and +2.9% than 2019(pre-pandemic level).

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