ISSUE BRIEF

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THE IMPACT OF EL NIÑO ON CLIMATE IN PAKISTAN

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Background

El Niño is a climate phenomenon that refers to the warming of the central and eastern tropical Pacific Ocean, specifically the surface waters. It is a natural event that occurs irregularly, typically every two to seven years, and can last from several months to over a year. El Niño is part of a larger climate pattern known as the El Niño-Southern Oscillation (ENSO). During a typical El Niño event, the warm oceanic waters shift eastward, altering the atmospheric circulation patterns in the region. This can have significant impacts on weather patterns around the world.[1]

According to the World Meteorological Organisation (WMO), there is a 60% chance for a transition from ENSO-neutral to El Niño during May-July 2023, and this will increase to about 70% in June-August and 80% between July and September. The development of an El Niño will most likely lead to a new spike in global heating and increase the chance of breaking temperature records. No two El Niño events are the same and the effects depend partly on the time of year.[2]

According to the Economist Intelligence Unit (EIU), there is a very high risk of an acute El Niño event causing severe economic disruptions to South Asia in 2023 by negatively impacting the agricultural

1 "What are El Niño and La Niña?" US National Ocean Service, February 2, 2023, https://oceanservice.noaa.gov/facts/ninonina.html

2 "WMO Update: Prepare for El Niño," WMO, May 3, 2023, https://public.wmo.int/en/media/press-release/wmo-update-prepare-el-ni%C3%B1o

sector due to extreme climate change events.[3] The development of El Niño, which is often associated with increased heat, drought, or rainfall in different parts of the world. Pakistan is already experiencing the impacts of climate change, which pose significant challenges to the country's environment, economy, and society will also be impacted by El Niño.

Impact on Pakistan[4][5]

The impacts of El Niño on climate in Pakistan can vary, but generally, it can lead to drier than normal conditions in the region. Here are some of the potential effects:

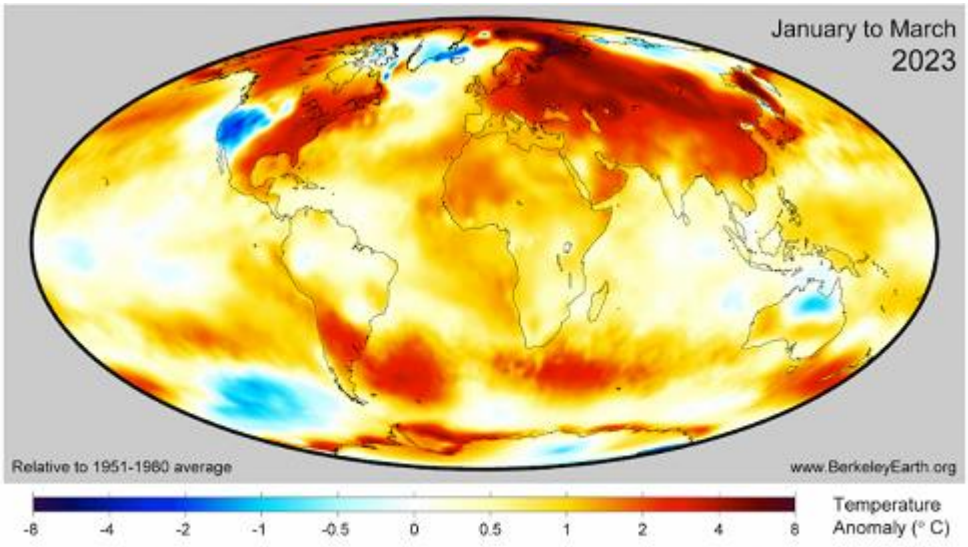
- Monsoon Rainfall: During El Niño years, Pakistan can experience variations in monsoon rainfall patterns. The monsoon rains may be below average or delayed, leading to drought conditions in certain regions. This can affect agriculture, water availability, and the overall economy, as agriculture is a vital sector in Pakistan.
- Temperature: El Niño can contribute to increased temperatures in Pakistan. The reduced cloud cover and rainfall during the weakened monsoon can result in hotter conditions, exacerbating heatwaves and posing risks to human health, especially in urban areas.
- Glacial Melt and Water Resources: Pakistan heavily relies on glacial meltwater from the Hindu Kush-Karakoram-Himalayan (HKH) region for its water supply. During El Niño events, the variability in monsoon rainfall can impact the glacial melt rates. Changes in precipitation patterns and temperature can affect the timing and quantity of water availability, which can have implications for agriculture, hydropower generation, and overall water security in the country.
- Flooding and Droughts: As with other South Asian countries, El Niño can disrupt the normal rainfall patterns in Pakistan. The weakened monsoon may result in reduced overall rainfall, leading to droughts and water scarcity in certain regions. Conversely, when the monsoon does arrive, it can bring intense and concentrated rainfall, leading to flash floods and the potential for damage to infrastructure, agriculture, and human settlements.

3 "El Niño: South and South-east Asia's 2023 wild card," EIU, May 11, 2023, https://country.eiu.com/article.aspx?articleid=1623253345&Country=China&topic=Risk&subtopic=Opera_1

4 Amin Ahmed, "Pakistan among 20 states at risk of excessive rainfall," Dawn, April 28, 2023, https://www.dawn.com/news/1749723

5 Humayun Rashid, Usman Mustafa, Muhammad Touseef-Ur-Rehman, "Capturing the Climatic Effects of El Nino and La Nina on the Economy of Pakistan," Bahria University Journal of Management & Technology, Accessed May 30, 2023, https://webcache.googleusercontent.com/search?q=cache:GLD6tBjghQMJ:https://www.bahria.edu.pk/bjmt/wp-content/uploads/2020/01/Capturing-the-Climatic-Effects-of-El-Nino-and-La-Nina.pdf&cd=15&hl=en&ct=clnk&gl=pk

- Biodiversity Loss: Changes in temperature and precipitation patterns can disrupt habitats, leading to shifts in species distribution, loss of biodiversity, and increased vulnerability for endemic and endangered species. This loss of biodiversity can have ecological, economic, and cultural impacts in Pakistan.



Global surface temperature anomalies for the first three months of 2023 compared to a 1951-1980 baseline period, taken from Berkeley Earth.

Policy Options for Pakistan

- Urgency of climate action through increased awareness and concerted efforts to mitigate the effects of climate change, particularly in vulnerable areas such as water management, agriculture, and disaster risk reduction.
- Need for robust policy frameworks and legislation to address climate change by enacting laws and regulations that promote sustainable development, climate resilience, and the transition to clean energy sources.
- Engaging in international cooperation and collaboration with global partners, including sharing knowledge, technology, and financial resources to support Pakistan's efforts in mitigating and adapting to climate change.
- Ensuring 'climate justice' with emphasis on the importance of addressing the needs and vulnerabilities of marginalised communities and ensuring their equitable participation in climate change mitigation and adaptation efforts.

Conclusion

It is important to note that while El Niño is a significant factor, it is not the sole determinant of climate variability in Pakistan. Other regional and local factors can also influence the weather

patterns, and the impacts of El Niño can vary from event to event. The Government of Pakistan and various organisations need to actively work to address the challenges of climate change through policy measures, adaptation strategies, and mitigation efforts. However, the scale of the issue requires continuous international cooperation and concerted efforts to mitigate the causes and adapt to the changing climate.