Climate Change Vulnerabilities and Climate Action in Sindh Province, Pakistan

By Dr **Asad Sayeed** and **Hussain Mallah**

September 24, 2024

The mega floods of 2022 was the latest of several episodes that demonstrate the extent of vulnerability that the province of Sindh in Pakistan suffers from climate related disasters. In partnership with the International Growth Center (IGC), we explored the impact of specific climate vulnerabilities that Sindh has suffered from in the recent past with a view to gauge their socio-economic impact and assess policy responses that are needed for appropriate mitigation strategies.

Salient Climate Vulnerabilities in Sindh

Based on episodes of climate related events in the recent past, we have identified four areas of climate vulnerability in Sindh. First is floods, both riverine and rain induced. In the last 14 years, there have been three episodes of severe floods – riverine floods in 2010, rain induced in 2011 and once again rain induced in 2022. The 2022 floods, in particular, claimed 1,092 lives, affected 12 million people, and resulted in the complete destruction of over 2 million houses, with 650,000 partially damaged. In all three flood related episodes the scale of the humanitarian crisis was extensive and the agriculture and food sectors were severely impacted, leading to increased food prices, shortages, and disruptions in jobs and livelihoods. The second climate related vulnerability in Sindh is droughts. Of the 30 districts in Sindh, eight are considered particularly vulnerable to droughts. In the recent past, the longest spell of drought was for four years, from 1999 to 2002. More recently, there was another spell of drought that lasted from 2020 to 2022. Third, the Indus Delta is facing a crisis of sea water intrusion because of natural disasters as well as controversial water distribution mechanisms. The extent of the erosion of the delta can be gauged by the fact that in 1988 the total cultivable land in the delta was 116928 acres and in 2018 it has been reduced to 48787 acres.

The PDMA reported that due to the threat of the Biporjoy cyclone in 2022, around 2500 houses were damaged,1800 livestock lost and over 1000 acres of cropped land were damaged. Fourth, the northern districts, desert zones and the coastal districts including Karachi have suffered extreme heat stress in the recent past. A long heat spell in June 2015 caused 1200 deaths in Karachi.

Economic and Social Impact of Climate Episodes

According to the World Bank, 15% of Sindh's GDP is lost every year to environmental damage and climate change While it is easy to estimate economic or direct losses to GDP but indirect cost estimation of social losses through induced or forced migration, food insecurity and water scarcity are not fully accounted for.

Specific to the four areas of climate vulnerability, as part of our qualitative field research we selected regions where each of the four climate hazards had taken place and conducted Key Informant Interviews (KIIs) with women and community leaders to gauge the economic and human impact these hazards have had on their lives.

One community leader in Dadu District that has been affected by floods said

“Our village is near the embankment of the Indus River. We are victims of dual calamities. We often face river floods and also flash (rain induced) floods. Because the Right Bank Outfall Drain (RBOD) is close to our village, our agricultural land turns saline at the time of floods and the groundwater becomes unsafe for drinking, resulting in health problems for the villagers.”

Another community leader from District Tharpakar told us about their coping strategies for droughts

The population of Tharparkar is diverse in terms of religion and caste. As such, when droughts set in, low caste Hindu families migrate to canal irrigated districts and work as farm labourers there. Because of a large number of people migrating and because they are Hindus and of low caste, they are paid poorly and are subject to exploitation by the landowners of fertile plains of Sindh.”

A woman participant from District Thatta talked about the impact of sea water intrusion

“Our village is 20 Km away from the sea and because irregular or no fresh water flows into the sea, half of our village land is not cultivable due to salinity. This has led to forced migration for some and others with some cultivable land are still here but living in poorer conditions than our grandparents lived in.”

On the impact of heat stress, a respondent from a poor locality in the mega city of Karachi said

“My wife died during the 2015 heat wave. Our home is congested and there is no ventilation in the rooms and kitchen. My daughter is mentally ill due to extreme heat and because she is still shaken by the trauma of her mother’s death.”

Policy Responses

The Sindh Government’s policy response to climate related events is mainly driven on disaster response and rehabilitation. The policy framework is based on by Natural Disaster Consortium (NDS), established in 2015 by the government of Sindh. This forum has been used by the provincial government to coordinate its response across line departments as well as different tiers of government and to strategically align donor resources to leverage donor funds for relief and rehabilitation. The World Bank has committed significant support for crucial initiatives like the 'Sindh Flood Emergency Rehabilitation Project,' focusing on infrastructure and the Sindh Peoples Housing for Flood Affectees (SPHF) to construct 2.1 million climate resistant houses for those who lost their homes during the 2022 floods.

Apart from the house reconstruction project, the focus of both the government as well as donors appears mainly on relief and rehabilitation. Since climate events are recurring and their frequency has increased, the policy framework falls short of concentrating on disaster risk reduction (DRR) and mitigation strategies. As mentioned earlier, the loss of GDP is alarming and warrants pre-disaster risk mitigation measures.

Subsequently, the Government of Sindh has approved Climate Change Policy in 2022. Although the policy does focus on Disaster Risk Reduction (DRR), along with Relief and Rehabilitation, it has so far not incorporated this policy in its institutional framework or allocated resources for short and long term investment on disaster preparedness.

Disaster Preparedness

Our research demonstrates that at a broad level, there are three principles of DRR that need to be incorporated explicitly in the province's policy framework. These are:

1. Put in place robust Early Warning Systems (EWS) that cover climate vulnerabilities at a local – say the district – level. This will reduce the risk in terms of lives and belongings of those impacted by disasters.
2. Make contingency allocations for social protection instruments, mainly for cash assistance to provide immediate support for climate change vulnerable households. Timely cash injection can improve food availability and smooth out consumption bottlenecks for such households.
3. According to UNDRR's Sendai Framework for Disaster Risk Reduction (DRR), a cardinal principle of an effective disaster response is to "leave no one behind." This is to ensure the inclusion of marginalized individuals and communities vulnerable to disaster related events.

Specific to the climate vulnerabilities identified in Sindh, we provide indicative DRR initiatives, based on the literature and our field research.

Floods: Investment in climate resistant key structural infrastructure (housing, schools, roads, embankments, bridges and barrages), restoration of traditional drainage channels and nonstructural measures, such as restoration of forest and eco-based land use can prevent soil erosion and also risk of flash floods.

Drought: Reduction in excessive exploitation of ground water is essential to maintain water tables useful for crop and fodder sustainability. Promotion of arid agriculture to maintain food-security, and supplies for livestock survival.

Sea water Intrusion: Higher river water flows are essential to contain sea water intrusion. Clear recognition of this phenomenon by river water authorities will go a long way in containing this hazard. Also, investment in creating embankments along the sea and promotion of saline agriculture will reduce the consequences of this hazard.

Heat Stress: It is critical that awareness raising on first-aid procedures to deal with heat stress are put in place. To reduce the risk of heat stress in the urban areas, better zoning and housing by-laws for construction and ventilation are important, particularly for children and the elderly.