



Policy Brief # PB-105-2025

October 16th , 2025

Water Security: The Need for a Resilient Pakistan

Muhammad Firas Shams
Research Associate



Water Security: The Need for a Resilient Pakistan

by

Muhammad Firas Shams

Introduction

There is a need to initiate an incisive policy debate on water insecurity in Pakistan which unfortunately appears to be a policy blind spot for the government. The bottom line is that the world will not achieve sustainable water management until 2049. (Nations, 2025) According to the 2017 U.S. Global Water Strategy, “Water may be the most important issue we face for the next generation.” (Center, 2025) Contrarily, According to WHO, at least 1.7 billion people worldwide are estimated to drink water that is not protected against contamination from feces. (Nations, Water , 2025) It goes without saying that water is absolutely essential for life itself. It is an indispensable component for agriculture, industrial production, human consumption and protecting the environment around us. To reiterate water security could be very well be defined as one of the cornerstones of sustainable development and is critically important for socio-economic development, food production, energy, healthy ecosystems and most essentially for human survival itself. Moreover, water security is also at the core of adaptation of climate change, functioning as the existential thread between the environment and the society. It is said that generally water is pivotal for all 17 Sustainable Development Goals (SDGs).

Water as a “Human Right” 2010

Additionally it needs to be emphasized that water is also a rights issue. A commendable milestone/feat of the UN is the recognition of “human right to water and sanitation” in July 2010 by the United Nations General Assembly. The aforementioned Assembly recognized the right of every human to have access to

enough water for personal and domestic uses, meaning between 50 and 100 liters of water per person per day. Moreover, the water must be affordable, safe and acceptable. In the same vein the water costs ought not to exceed 3 percent of household income. Furthermore, the water source has to be within 1,000 meters of the home and collection time should not exceed 30 minutes. (Nations, Water , 2025)

As we witness global populace monumentally expand, there is a grave need to strike a balance amongst competing commercial demands for water resources in order to make sure that local communities have sufficient if not copious water resources for their needs. Not least, it is necessary to underscore that women and girls must have improved access to clean as well as private sanitation facilities to manage maternity and menstruation in tandem with safety and dignity. Furthermore, from the perspective of a human being, water security cannot be siloed from sanitation. Concurrently, both are indispensable for decreasing the global burden of disease and enhancing the economic productivity, education and health of populations.

The Multipronged Severity of Water Insecurity

As demand for water surges with uncertainty devised by shifts in physical environment ramps up, several local communities the world over already confront water crises that aggravate the double whammy of poverty and diseases, compounding energy and food insecurity, eroding economic growth and adversely impacting biodiversity. Moreover, the Office of the Director of National Intelligence (ODNI) reported in a 2020 memorandum that over the course of next 2 to 3 decades, there will be countries not least the ones affected by acute spells of drought that may face internal political schisms and interstate geopolitical competition. (Center, 2025) In the year 2021, the National Intelligence Estimate on Climate Change recapitulated that the future will witness countrywide instability. In other words greater pressure on energy and food systems, adverse ramification on healthcare, internal conflict and insecurity, increased demand for aid and humanitarian relief along with pressure on military readiness. In addition, such countries can also confront geopolitical flashpoints ensuing from water insecurity such as cross-border water tensions and migration.

Statistical Dire Straits of Water Insecurity Across the Globe

Water related challenges can be statistically acknowledged from the fact according to the WHO/UNICEF, 2.2 billion citizens of the world still lack access to safely managed drinking water services, including 115 million people who drink surface water. Moreover, according to WHO/UNICEF, 3.5 billion people still lacked safely managed sanitation, including 419 million who practiced open defecation. Apart from this, according to WHO improving access to water, sanitation and hygiene can save 1.4 million lives per year. WHO also states that better water, sanitation, and hygiene could prevent the deaths of around 1,000 children under 5 per day. Furthermore, based on findings by FAO/UN-Water approximately 10 percent of the global population lives in countries with high or critical water stress. Along with this the World Bank states water-related disasters have dominated the list of disasters over the past 50 years and account for 70% of all deaths related to natural disasters. WHO also notes that 44% of household wastewater is not treated properly, damaging ecosystems and human health. Lastly according to FAO, 72% of all freshwater withdrawals are used by agriculture. (Nations, Water , 2025)

The Inadequate Global Progress of Sdg 6: A Grave Policy Deficiency

Sustainable Development Goal (SDG) 6 is to “*Ensure availability and sustainable management of water and sanitation for all*”. United Nations particularly UN Water has shared some egregious statistics which are as follows:

- Almost 2.2 billion people (nearly 1 in 4 people around the world lacked safely managed drinking water in 2022.
- Nearly, 3.5 billion people lacked safely managed sanitation services and 419 million people practised open defecation in 2022. (43% of the global population)
- Virtually, 2 billion people lacked a basic hand-washing facility with soap and water at home in 2022. (25% of the global population)
- Only 27% of the industrial wastewater is safely treated based on limited data from only 22 countries.
- Just 42% of the household wastewater is not safely treated.
- Only 56% of monitored water bodies in 120 countries were classified as having “good ambient water quality”.

- By 2030, the health and livelihoods of 4.8 billion people could be at risk if current water quality is not improved.
- On the bright side, from 2015 to 2021 water-use efficiency has increased by 19.3% globally.
- Approximately, 58% of the countries still exhibit low water-use efficiency, with less than \$20 added value for each cubic meter of water used from all economic activities over time.
- Approximately, 10% of the global population lived in countries with high and critical water stress levels in 2021.
- The bottom line is that the world will not achieve sustainable water management until 2049.
- 40% of the countries are being left behind, having limited capacity to balance competing demands across sectors and cope with increasing pressures.
- Only 43 out of 153 UN member states sharing trans-boundary waters have operational arrangements covering 90% or more of their shared rivers, lakes and aquifers.
- Furthermore, at least 20 countries lack any arrangements for sharing trans-boundary waters. (Nations, Water , 2025)

The Exacerbating Water Crisis in Pakistan

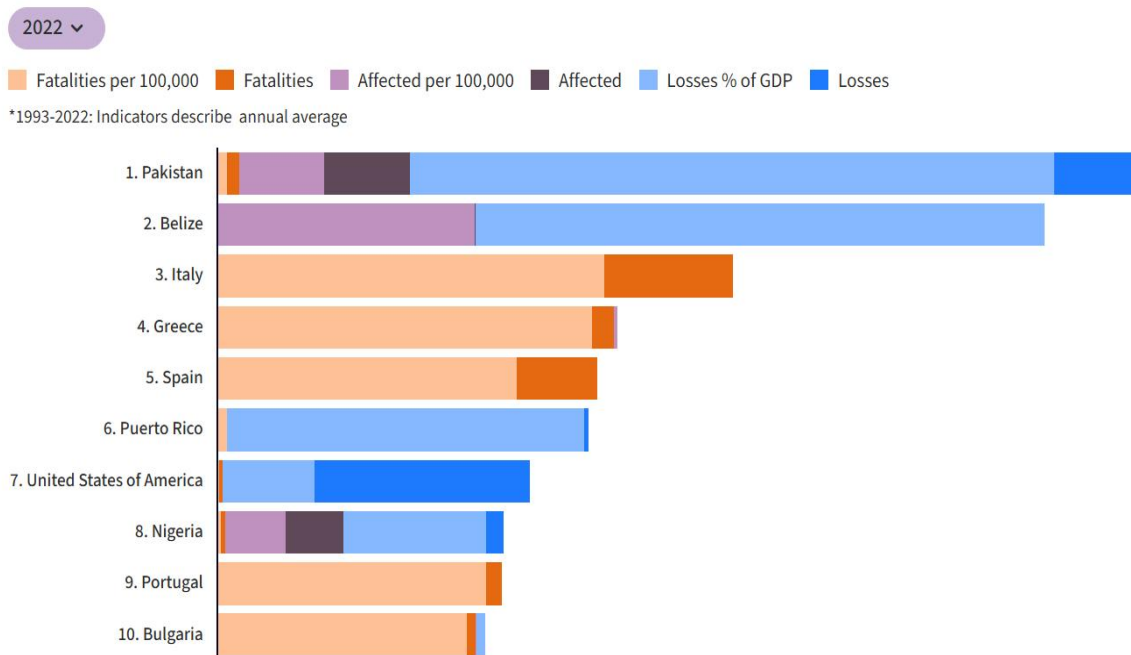
From 1993 to 2022, more than 765,000 lives were lost and direct economic losses of nearly USD 4.2 trillion (inflation-adjusted) were recorded, driven by more than 9,400 extreme weather events. The frequency and intensity of climate-related disasters continue to rise, and these figures underscore the urgent need for climate action. It is noteworthy that Pakistan's water resources have already been hampered by the climate change adversity due to the fact the country experiences superfloods/cloud bursts, droughts, melting glaciers, and rising temperatures that area erratically fluctuating the timing of the water flow. It is estimated that 80% of Pakistan's agriculture as well as 33% of its hydropower hinges on water from the Indus Basin region. Notwithstanding the 2022 and 2025 floods, according to Daniel Haines, Associate Professor in the History of Risk and Disaster at University College London, the regions that now make up most of Pakistan as part of the Indus Basin, they're alluvial plains, so they're very fertile, but typically don't have that much

rainfall. The ambition to increase the acreage of farmland outstripped the amount of water that was available. (Time, 2025)

The Looming Sword of Climate Risk in Pakistan

According to a 2025 Germanwatch report, Pakistan ranked as the most vulnerable country to climate change on the Climate Risk Index (CRI) amongst top 10 countries in the world. According to data from 2022, Pakistan has had 0.75 fatalities per 100,000 people, 1765 fatalities in total, 33,016,869 total affected, 4% loss in GDP and recording approximately \$54 billion in losses. In other words, climate change rattled Pakistan to its core and the ongoing floods of 2025 will have a much more detrimental impact across the economy, affectees and fatalities, as such weather pattern “on steroids” is becoming the new normal in a Potemkin village of a country like Pakistan. (Greenwatch, 2025)

Climate Risk Index: Top 10 Most Affected Countries



Source: Greenwatch

The Ticking Bomb of Deglaciation in Pakistan

Moreover, a 2024 joint study by Pakistan’s Ministry of Climate Change and Italian research institute, EvK2CNR reveal that Pakistan has over 13,000 glaciers critical reservoir of freshwater in South Asia. (DAWN, 2024) According to Al Jazeera the city of Skardu and adjoining region is alone home to more than 7,000 glaciers.

(Hussain, 2024) Glaciers in Pakistan are undergoing deglaciation, with a notable general reduction in area as well as size, although rates oscillate by time period and region. For example, the total clean-ice glacier area in Chitral decreased by 30.8% (816 km²) between 1992 and 2022. Recession accelerated after 2007, but some areas like the Gilgit watershed showed a more stable trend with only minor decreases. Factors influencing deglaciation include rising temperatures, increased rainfall in mountain areas, and the formation of dangerous glacial lakes. Moreover the Raman Glacier, in Upper Chitral receded by 33.6% (3.25 km²) between 1992 and 2022. With this alarmingly over 3,000 glacial lakes have formed in Gilgit-Baltistan and Khyber Pakhtunkhwa, with 33 identified as potentially prone to Glacial Lake Outburst Flooding (GLOFs).¹ (Zahir Ahmad, 2025)

The Impending Woe of Water Scarcity in Pakistan

Grounded in some of the measures of water availability like water poverty index and Falkenmark index, Pakistan currently ranks as the 15th most water-stressed nation in the world. The floods of 2022 and 2025 present a highlight a squandered opportunity, the inability to store excess water. Limited dam storage and poor urban watershed management result in the loss of floodwaters as runoff, rather than their storage for dry spells. (Khalid, 2025)

Here climate scientists have repeatedly warned about extreme weather volatility, with floods and droughts alternating as the new normal for South Asia. Without resilient water storage infrastructure and rainwater harvesting, both urban and rural areas in Pakistan will remain trapped in a cycle of water excess followed by water scarcity.

According to the International Organisation for Migration (IOM), Pakistan is predicted to slip into absolute water scarcity by 2035, a grim prospect for the world's fifth most populous country. Moreover the World Wildlife Fund-Pakistan (WWF-P), states that the country's annual per capita water availability has plummeted from about 5,600 cubic meters in 1947 to just 930 cubic meters in 2023 which is dangerously below the level conventionally defined as water scarcity. According to Food and Agriculture Organisation (FAO) of the United Nations, Pakistan's water

¹ GLOF means Glacial Lake Outburst Flood, a sudden and catastrophic release of water and detritus from a glacial lake that has formed due to melting glaciers.

stress is among the highest globally, underscoring that securing the resource is now a matter of national survival. (Khalid, 2025)

Furthermore, World Bank Climate Change Knowledge Portal (CCKP) stated that Pakistan's average temperature is projected to rise by 4.9 Degree Celsius by 2090, speculating an even greater hydrological volatility. Erratic monsoon rains and a vicious cycle of drought followed by flood have already become the new normal. (Khalid, 2025)

Blueprint Towards Sustainability

1. Integrated Water Resource Management (IWRM)²:

- In terms of having a holistic approach IWRM entails lining up water utilization with the needs of different users and the environment, employing a framework for management of water resources holistically. The focus is on efficiency, conservation, and protection of water sources.
- Secondly, policy and cooperation are sine qua non for implementing at all tiers particularly trans-boundary cooperation, to guarantee long-term water security.

2. Enhancing Conservation and Efficiency

- Enhance agricultural efficiency by adoption of water-saving techniques, inter alia, conservation agriculture, micro-irrigation, and crop switching, can significantly reduce water waste.
- Secondly, it is key to reduce water loss by taking care of leaks water distribution systems and reducing overall water consumption helps conserve precious resources.
- Thirdly, adopt and promote conservation in households and industries, alongside awareness campaigns on sustainable diets, helps to reduce water demand.

² Integrated Water Resources Management (IWRM) is a collaborative process for managing water, land, and related resources to maximize economic and social welfare while ensuring the sustainability of vital ecosystems.

3. Amplifying Water Sources and Reutilization

- Rainwater harvesting which encompasses capturing and storing rainwater is a resilient strategy, especially useful in areas with uneven rainfall to supplement supplies during dry periods.
- Another recommendation is to reusing safely treated wastewater which can function as an affordable and sustainable source for irrigation, industrial, and municipal purposes, providing water, energy, and nutrients.
- Exploration, protection, and sustainable management of groundwater resources is critical for adapting to climate change and meeting population needs.

4. Safeguarding Water Ecosystems

- Protection and restoration of water-related ecosystems like forests, wetlands, rivers, and aquifers is absolutely critical for maintaining a healthy water cycle and providing water security.
- Ecosystem-Based Approaches ought to be employed in coastal and marine areas which can preclude significant adverse impacts and promote the long-term health of oceans.

5. Leveraging of Innovation, Data and Technology

- Data-driven decisions are required since high-quality data on water resources is essential for informed water management and policy-making.
- Water-Saving Technologies are requisite for implementing water-saving, green, and hybrid technologies in industry and agriculture that can significantly improve efficiency and sustainability.
- Development of new infrastructure is crucial that incorporates water considerations ensures sustainable and inclusive provisioning and creates new avenues for water reuse.

Bibliography

- Center, G. W. (2025). *Why Water Security is Important*. Retrieved from ua-gwsc.org: <https://ua-gwsc.org/why-water-security-is-important-to-understand/>
- DAWN. (2024, November 8). *Study identifies over 13,000 glaciers in Pakistan*. Retrieved from [www.dawn.com: https://www.dawn.com/news/1870826/study-identifies-over-13000-glaciers-in-pakistan](https://www.dawn.com/news/1870826/study-identifies-over-13000-glaciers-in-pakistan)
- Greenwatch. (2025). *Climate Risk Index 2025*. Retrieved from [www.germanwatch.org: https://www.germanwatch.org/en/crisis/](https://www.germanwatch.org/en/crisis/)
- Hussain, A. (2024, May 12). *Guardians of the glaciers - life beside Pakistan's vanishing ice*. Retrieved from [www.aljazeera.com: https://www.aljazeera.com/features/longform/2024/5/12/guardians-of-the-glaciers-life-alongside-pakistans-vanishing-ice](https://www.aljazeera.com/features/longform/2024/5/12/guardians-of-the-glaciers-life-alongside-pakistans-vanishing-ice)
- Khalid, S. A. (2025, July 28). *Water scarcity in Pakistan — a geopolitical ticking time bomb*. Retrieved from [www.dawn.com: https://www.dawn.com/news/1913435/water-scarcity-in-pakistan-a-geopolitical-ticking-time-bomb](https://www.dawn.com/news/1913435/water-scarcity-in-pakistan-a-geopolitical-ticking-time-bomb)
- Nations, U. (2025). *Goal 6: Ensure access to water and sanitation for all*. Retrieved from [www.un.org: https://www.un.org/sustainabledevelopment/water-and-sanitation/](https://www.un.org/sustainabledevelopment/water-and-sanitation/)
- Nations, U. (2025). *Water*. Retrieved from [www.un.org: https://www.un.org/en/global-issues/water](https://www.un.org/en/global-issues/water)
- Time. (2025, May 9). *Climate Change Is Straining Pakistan's Water. Tensions With India Could Make It Worse*. Retrieved from [time.com: https://time.com/7284470/india-pakistan-water-supply-climate-change/](https://time.com/7284470/india-pakistan-water-supply-climate-change/)
- Zahir Ahmad, F. A. (2025). Glacier Recession and Climate Change in Chitral, Eastern Hindu Kush Mountains of Pakistan, Between 1992 and 2022. *Geosciences* .