

PAKISTAN'S WATER SECURITY ISSUE

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(Views expressed in the brief are those of the author, and do not represent those of ISSI)



Pakistan is highly vulnerable to the impacts of climate change, including water scarcity, extreme weather events, and declining crop yields. In the ongoing Kharif season, the country is heading towards a massive water shortage, somewhere between 27 percent and 35 percent, only months after unprecedented floods.¹ Pakistan is now one of the top ten nations impacted by global warming and may soon become one of the most water-stressed countries in the world as the shortages increase. ²

Water security is, rightly, linked to human rights, with the right to access to clean water considered the basic human right of every citizen. However, due to growing population, careless use of water along with changes in weather patterns because of global warming, countries around the world, both wealthy and poor, face increasing water scarcity in the 21st century. The UN reports that globally three billion people are facing water shortage with one billion facing hunger today. Moreover, the Global Risks Report of the World Economic Forum (WEF) ranked water crises as the third most important global risk in terms of impact on humanity.³

¹ Khaleeq Kiani, Massive water shortage likely months after unrepresented floods. Dawn, March 29, 2023, <https://www.dawn.com/news/1744764>

² Water shortages, Dawn, March 30th 2023, <https://www.dawn.com/news/1744957/water-shortages>

³ "The Global Risks Reports, 2021, 16th Edition", World Economic Forum, 2021. https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf

The State of Water Management and Challenges

Water scarcity has become a serious threat to the sustainable and economic growth of Pakistan. The country ranks 14 among the 17 'extremely high-water risk' countries of the world, a list that includes hot and dry countries.⁴ Over 80% of the total population in the country faces severe water scarcity for at least one month of the year.

Pakistan's groundwater resources, the last resort of water supply, are severely overdrawn, mainly to supply water for irrigation. If the situation remains unchanged, the whole country may face severe water scarcity by 2025. The situation is strategically more complicated, as Pakistan is the lower riparian country to India and 78 percent of its water inflows from therein.⁵ Over the last few decades, Pakistan has drastically changed from being a water abundant country to a water-stressed country. With 2.8 percent of the global population, Pakistan accounts for 0.5 percent of global renewable water resources. Worldwide, the country ranks 36th in total renewable water resources. In the overall context, Pakistan's water crisis is explained mainly by rapid population growth followed by climate change (floods and droughts), poor agricultural sector water management, inefficient infrastructure (wastage) and water pollution. Agriculture is the largest water consumer, accounting for 94 percent of annual water withdrawals followed by households (5.3 percent) and industry (including power generation) (0.8 percent).

The country's dependence on a single river system is extremely risky: the Indus River system accounts for 95.8 percent of the total renewable water resources of Pakistan.⁶ The water originating from outside of Pakistan accounts for over three-fourths (78 percent) of total water resources of the country, making it vulnerable.

Over 63 percent of globally produced wastewater is collected, 52 percent is treated (48 percent is released untreated), while 11 percent is reused.⁷ With a mere 1 percent treatment of collected wastewater, Pakistan ranks among the countries with the lowest water treatment rate. Pakistan can better use its water resources by efficient consumption patterns and more recycling of water.

⁴ World Resource Institute. 2021. "Aqueduct Water Risk Atlas." <https://www.wri.org/data>.

⁵ Food and Agriculture Organisation of the United Nations. 2021. AQUASTAT. <https://www.fao.org/aquastat>.

⁶ Young W. J., A. Anwar, T. Bhatti, E. Borgomeo, S. Davies, W. R. Garthwaite III, E. M. Gilmont, C. Leeb, L. Lytton, I. Makin, and B. Saeed. 2019. Pakistan: Getting More from Water. Washington, D.C.: World Bank. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/251191548275645649/pakistan-getting-more-from-water>

⁷ Jones, E.R., M.T.H. van Vliet, M. Qadir and M.F.P. Bierkens. 2021. "Country-level and Gridded Estimates of Wastewater Production, Collection, Treatment and Reuse." *Earth Syst. Sci. Data* 13 (2): 237-54. <https://inweh.unu.edu/country-level-and-gridded-estimates-of-wastewater-production-collection-treatment-and-reuse/>

There are several factors affecting Pakistan's water security and few are underlined below:

- Pakistan is among the list of 10 most vulnerable countries of the world to climate change. The country is already facing climate-related threats to water resources as is evident from the change in monsoon patterns, receding glaciers, rising temperatures, and recurrence of floods and droughts. Pakistan has witnessed several floods in the past several years and long spells of drought. Climate change may decline aggregate water flows in the future.
- With population crossing 220 million people, the country's water demand could reach 274 million acre-feet while the supply of water could remain at 191 million-acre-foot. Pakistan's population is projected to increase by over one-half (53 percent), reaching 338 million by 2050. The share of the population living in cities is also projected to increase from 37.2 percent in 2020 to 52.2 percent in 2050.⁸ If water efficiency remains the same, the water withdrawal to water resources ratio may exceed 100 percent in coming decades.
- Pakistan's irrigation has an overall efficiency of 39 percent, with over 80 percent of the country's water resources being used by four major crops, rice, wheat, sugarcane, and cotton which contribute only 5 percent to GDP.⁹ The productivity of these crops is low in Pakistan compared to other major agricultural economies of the world. The crumbling of water infrastructure contributes to extensive water wastage.
- Every year about half of the two million produced wet tons of human excreta go on to pollute water in Pakistan. According to a study, in Pakistan 60 million people are at risk of exposure to high concentrations of arsenic in groundwater on the Indus Plain.¹⁰ Water-borne diseases are a leading cause of death and suffering in Pakistan. Overall, about 60 percent of people in Pakistan are suffering from one or more of the main diseases associated with inadequate provision of drinking water and improved sanitation.¹¹ Sixty thousand people in Pakistan died prematurely due to inadequate water and sanitation facilities; half of them were children under-five, and emergence of diseases like polio, dengue fever, and hepatitis A and E. The economic costs to Pakistan of poor water and

⁸ UNDP (United Nations Development Programme), Pakistan, Development Advocate Pakistan: Water Security in Pakistan: Issues and Challenges 3 (4): 22-25. Islamabad: UNDP, Pakistan, 2016

⁹ Young W. J., A. Anwar, T. Bhatti, E. Borgomeo, S. Davies, W. R. Garthwaite III, E. M. Gilmont, C. Leeb, L. Lytton, I. Makin, and B. Saeed. 2019. Pakistan: Getting More from Water. Washington, D.C.: World Bank. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/251191548275645649/pakistan-getting-more-from-water>

¹⁰ Joel E. Podgorski, Extensive arsenic contamination in high-pH unconfined aquifers in the Indus Valley, Science Advances, August 2017, <https://www.science.org/doi/10.1126/sciadv.1700935>

¹¹ Poverty reduction strategy paper, Finance division, Govt. of Pakistan, 2015-2016, <http://www.finance.gov.pk/poverty/PRSP-II.pdf>

sanitation, floods and droughts are estimated to be 4.0 percent of the GDP or about US\$ 12 billion per year.¹²

Conclusion

Pakistan's water crisis is explained mainly by rapid population growth followed by climate change (floods and droughts), poor agricultural sector water management, inefficient infrastructure, and water pollution. There is a need to fill the vacuum between policies, reforms, and their implementation by devising a detailed implementation plan. According to experts, we do not have a water crisis; we have a failure of governance regarding water issues. It is key to leverage technology for efficient water utilisation; however, it is also crucial to choose the right innovation, so it delivers the desired solution that is needed. Farmers can use precision watering rather than flooding their fields. One of the biggest advances in modern agriculture is drip irrigation. Similarly, water-intensive crops as sugar cane and rice may be replaced with lower water demanding crops.

¹² Young W. J., A. Anwar, T. Bhatti, E. Borgomeo, S. Davies, W. R. Garthwaite III, E. M. Gilmont, C. Leb, L. Lytton, I. Makin, and B. Saeed. 2019. Pakistan: Getting More from Water. Washington, D.C.: World Bank. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/251191548275645649/pakistan-getting-more-from-water>