

Flooding in Pakistan: Rethinking the Dam Debate

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Abstract

Pakistan faces a grave issue of consistent flooding which has a massive impact on the country. The constantly recurring floods destroy the agriculture of Pakistan and this in turn affects the livelihood and income source of the agricultural workers. Furthermore, the damage to the country's infrastructure is also a setback. When remediation measures are suggested, one of the most often presented solutions is the creation of dams, however, they are far from being an easily managed solution. The creation of dams as a remediation measure is also not the easiest solution due to the excessive ecological, financial, as well as social costs which are required for this to go through. The main essence of this article is examining the advantages and limitations of the construction of dams in Pakistan. This article will discuss various approaches which will focus on solutions related to selective infrastructure with ecosystem-based adaptation, cooperation within boundaries, as well as urban planning which cannot be easily affected by climatic conditions.

Keywords: Flood management; Pakistan; Dams; Climate change adaptation; Ecosystem-based adaptation.

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Introduction

Pakistan has been ranked one of the most vulnerable countries globally in terms of its climatic conditions (1). The constantly occurring floods, the severity of which was utmost extreme in the years noted to be 2010 and 2022, have caused massive displacement of millions of people in the flood affected areas. Not only is there the issue of the massive displacement of the people, but the consequences of the floods have also seen to inflict economic losses exceeding approximately USD 30 billion (2). These disasters have triggered a question on whether or not large dams can play a role in protecting the country from climatic extremes and disasters. In the debate of whether or not creating dams can be a good remediation measure for floods, there are strong arguments where critics explain that creating new mega dams will cause major harm to the country when considering the aspect of displacement, sedimentation, as well as ecological risks which will inevitably be part of the dam creation process (3). When considering the flooding situation in 2025 in Punjab, it was seen that the floods were worsened by water released from Indian dams (4,5). The debate remains focusing on the question of whether or not the creation of dams is a national necessity or a mere obsession. This article focuses on examining whether the creation of dams can actually address flooding while also exploring strategies for sustainable water governance.

Flooding Realities in Pakistan

Flooding in Pakistan is caused by a combination of natural and human-induced factors. Monsoon variability, intensified by climate change, produces unprecedented rainfall events (6). Simultaneously, accelerated melting of the glaciers in regions such as that of the Himalayas feeds the Indus River system, which leads to excessive water flows (7). Poor urban planning further worsens the situation, since the drainage channels in cities like Karachi and Lahore have been encroached upon or neglected by the public (8). The people consistently and increasingly demand for multiple small dams and improved maintenance, alongside non-structural measures like zoning and preparedness (9).

The 2022 mega-floods in Pakistan highlighted how poorly sited check dams and structural failures intensified downstream flooding (10).

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This dual burden, riverine flooding in rural belts and flash flooding in urban centers, reveals systemic weaknesses and the flaws in the governance as well as infrastructure of Pakistan (11). Dams are often considered to be the sole engineering solutions for such situations, so that they may be able to control the excessive water surges, yet their efficacy is not easily guaranteed.

The Case for Dams

The argument which supports the creation for dams emphasizes benefits which are the following:

1. **Flood Regulation:** The creation of reservoirs and dams can absorb intense flows, which can help reduce downstream flood risks (12).
2. **Water Storage:** There is insufficient water storage capacity in Pakistan's existing dams. Pakistan can store only 30 days of water whereas other countries such as India can store 170 days of water and similarly Egypt can provide 700 days of water storage in their systems (13). It is therefore seen to be a necessity for Pakistan to increase its capacity for food security.
3. **Energy Security:** Turning towards Hydropower system will reduce reliance on imported fossil fuels which are extremely costly for Pakistan, and if substituted with an economically feasible power source will lower costs as well as reduce emissions (14).

In this scenario the creation of projects like Diamer-Bhasha Dams and Dasu are therefore framed as both development and resilience strategies.

The Case against Dams

The dams present profound challenges. Sedimentation reduces reservoir life expectancy: Tarbela has already lost one-third of its storage capacity (15). Recent hydrological assessments show that inadequate spillway capacity at Mangla Dam poses significant overtopping and piping risks (16).

Social displacement uproots communities, often without adequate resettlement (9). Ecological damage disrupts riverine ecosystems and accelerates sea intrusion in the Indus delta, which negatively affects and destroys fisheries and agriculture in Sindh, where the aquatic industry is a major source of income (17).

Finally, the financial risks which such tasks bring along are intense. Diamer-Bhasha's projected cost exceeds approximately USD 15 billion (18). This is clearly an extremely straining to the economy of an already debt burdened economy such as that of Pakistan. Such investments may crowd out alternative adaptation strategies that offer higher returns for lower costs.

Beyond the Dam Binary

There are a number of alternatives and complements for the dams' creation situation which include the following:

- **Ecosystem-based approaches:** Restoring wetlands and floodplains so that they are more readily capable of absorbing excess water is a good approach (19).

- **Small-scale storage:** In water-scarce regions like Balochistan, decentralized check dams and recharge systems can play an important role in capturing rainwater and replenishing groundwater supplies. (20).
- **Strengthening urban resilience:** Cities can become more resilient by properly enforcing zoning laws, fixing and upgrading storm water drains, and investing in stronger, and more reliable infrastructure (8).
- **Cross-border cooperation:** Since the greater majority, approximately 90% of the water originates in India, it is essential that Pakistan and India focus on improving their relations and strengthening the Indus Waters Treaty (21).

Conclusion

Dams cannot be considered the only solution when trying to secure and protect Pakistan against the water crises it faces. Although selective infrastructure can be considered an option, yet relying excessively on this creates the risks of repeating mistakes which had been made previously. Instead, it is necessary that Pakistan turns towards a strategy which is a combination of dams with ecological restoration, adaptation, as well as cooperation in the regions.

Ensuring the adaptation of policies based on evidence is necessary for Pakistan in order to withstand the threats of flooding as well as scarcity in the scenario of climate change.

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Authors' Contribution:

IS: Conceived and drafted the manuscript, acquisition, analysis, and interpretation of the data

AK: Conception and critical revision

Both the authors have reviewed and approved the final version of the manuscript. The authors agree to be accountable for all aspects of the work.

References

1. World Bank. Climate risk profile: Pakistan. Washington (DC): World Bank; 2022.
2. United Nations Development Programme. Pakistan floods 2022: post-disaster needs assessment. Islamabad: UNDP; 2022.
3. Qureshi AS. Water management in Pakistan: issues and options. Pak J Agric Sci. 2011;48(1):1–10.
4. Reuters. Pakistan on exceptionally high flooding alert as India releases water from dam. 2025. Available from: <https://www.reuters.com/sustainability/land-use-biodiversity/pakistan-exceptionally-high-flooding-alert-says-india-released-water-dam-2025-08-26/>
5. Wikipedia contributors. 2025 Punjab, Pakistan floods. Wikipedia; 2025. Available from: https://en.wikipedia.org/wiki/2025_Punjab%2C_Pakistan_floods
6. Lutz AF, Immerzeel WW, Shrestha AB, Bierkens MFP. Consistent increase in High Asia's runoff due to increasing glacier melt and precipitation. Nat Clim Change. 2019;4(7):587–92.

7. Bolch T, Kulkarni A, Kaab A, Huggel C, Paul F, Cogley JG, et al. The state and fate of Himalayan glaciers. *Science*. 2019;336(6079):310–14.
8. Hasan A. Urban flooding in Pakistan: causes and solutions. *Int J Disaster Risk Reduct*. 2020;47:101–15.
9. Mustafa D. *Hydropolitics in Pakistan's Indus Basin*. Washington (DC): United States Institute of Peace; 2010.
10. Ahmad Z, Khan HF, Akbar T. Insights from the 2022 Pakistan mega-flood and climate. *Nature*. 2025;1–12. doi: 10.1038/s44304-025-00096-1
11. Aziz M, Khan F, Ullah S. Remote sensing assessment of agricultural and urban damage during 2022 floods in Pakistan. *arXiv*. 2024. Available from: <https://arxiv.org/abs/2410.07126>
12. World Commission on Dams. *Dams and development: a new framework for decision-making*. London: Earthscan; 2000.
13. Food and Agriculture Organization. *Water resources in the Near East: North Africa and Asia*. Rome: FAO; 2021.
14. Gul S, Asghar A, Rehman H. Hydropower development in Pakistan: prospects and challenges. *Renew Energy*. 2021;170:1116–27.
15. Water and Power Development Authority. *Annual report*. Lahore: WAPDA; 2018.
16. Ali S, Rehman S, Shah M. Hydrological risk assessment for Mangla Dam using historical flood hydrographs. *SN Appl Sci*. 2023;5(3):579. doi: 10.1007/s42452-023-05579-2
17. Inam A, Clift P, Giosan L, Tabrez AR, Tahir M, Rabbani MM, et al. The geographic, geological and oceanographic setting of the Indus River. *Cont Shelf Res*. 2007;27(14):1668–90.
18. World Bank. *Diamer-Bhasha Dam project appraisal*. Washington (DC): World Bank; 2020.
19. Rasul G. Ecosystem-based adaptation for climate change: lessons from the Hindu Kush Himalayas. *Mt Res Dev*. 2014;34(3):233–43.
20. Shah SH, Kazmi JH, Iqbal M. Small dams and water harvesting structures for drought-prone areas of Balochistan. *Pak Dev Rev*. 2019;58(4):621–40.
21. Wolf AT, Newton J. Case study of transboundary dispute resolution: the Indus Waters Treaty. *Int Water Resour Assoc*. 2008;33(2):204–14.