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ISSUE BRIEF

Recasting Pakistan's Water Scarcity Challenge

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Pakistan's water situation is at a crossroads. The country has been increasingly cited by international organizations for being on the brink of water scarcity because of its declining per capita water availability. At the same time, the architecture of water resource governance in the country is undergoing a major overhaul. In 2018, Pakistan's first-ever National Water Policy was enacted by its federal government. Each of the provinces have also come up with their own legal rules for water management, as water is a provincial concern. The Punjab Water Act of 2019 was the first provincial legislation to pass, followed by the Khyber Pakhtunkhwa Water Bill of 2020, and Sindh continues to make progress on their own version.

Recent legislative and policy changes have been celebrated as historic by many, but there is a lot to unpack to understand how these changes will affect people on the ground. For instance, the legislation from Punjab and Khyber Pakhtunkhwa (KPK) delineated the role of service providers or undertakers, who will be allowed to charge for the provision of water services, but failed to undertake a broader debate on the equity implications of water pricing. The Punjab Water Act of 2019 also envisions the creation of regulatory authorities for safeguarding consumer interests, to ensure equity and fairness in water provision, but lacks any practicable roadmap that defines what specific consumers and what kinds of water use will be covered. It is unclear whether the new legislation displaces the existing mix of colonial and post-colonial laws governing water, or how it can be implemented within the state's existing institutional setup.

Women with empty canisters wait for their turn to get water from a free water distribution point in Orangi Town on the outskirts of Karachi, Pakistan March 19, 2021. Picture taken March 19, 2021. REUTERS/Akhtar Soomro TPX IMAGES OF THE DAY

At this critical juncture, the Atlantic Council's South Asia Center and the Frederick S. Pardee Center for the Study of the Longer-Range Future at Boston University's Pardee School of Global Studies organized a private, off-the-record roundtable to discuss Pakistan's key water challenges. The Atlantic Council's last dialogue on Pakistan's water resources, organized almost a decade ago, focused on transboundary water cooperation between India and Pakistan through a Track II initiative. In this latest roundtable, participants focused on water governance issues within Pakistan and proposed solutions likely to be the most attainable in the current political climate. During the discussions, water researchers and experts from both within and outside Pakistan advocated for moving away from mainstream discourse toward a more imaginative reframing of Pakistan's water challenge. Participants worked to outline a novel approach to analyzing the country's water challenge—an approach that is more holistic, equitable, and people-centered. The key takeaways from the discussion, expanded on below, were that Pakistan's water scarcity debate must be reframed, climate change is the principal water issue, cities are now at the forefront of Pakistan's water challenge, and that water governance must be reimagined going forward.

Pakistan's water security debate must be reframed

Mainstream discourse on Pakistan's water issues has long been monopolized by engineers advancing a rather depoliticized and elite-serving perspective. In practice, long-standing emphasis on water scarcity and an obsession with dams, quantifiable metrics, and averages took attention away from the actual human cost of water insecurity.

Participants emphasized the need to reframe the conversation around Pakistan's water security and move away from a narrow focus on water scarcity. When the debate is framed in terms of scarcity, the solutions that emerge tend to em-

phasize somehow increasing the amount of water available or managing volatile variability in the availability of water in the country. However, the total amount of water will essentially stay the same, even as the government attempts to enhance storage through dams and reservoirs. Pakistan should instead learn strategies from countries that are managing with fewer water reserves or lower water availability per person, such as Morocco, to improve water governance and the outcomes derived from the existing endowment of surface and groundwater resources.

To change the existing conversation on water, participants advocated for deemphasizing metrics and averages routinely used in quantifying Pakistan's water challenge. Average water availability indicators deceptively position the entire country as water scarce, obscuring pockets of abundance, elite capture, and the unequal distribution of water resources within the country. Countries themselves are not water scarce per se—particular regions and cities within a country are water insecure. For instance, the 20 million residents of Karachi require about 1.1 billion gallons of water daily, but only half of this amount is actually afforded to its residents. And even within a water insecure city like Karachi, there exists differential access to available water resources based on economic and political power of its inhabitants. In such cases, a focus on average and total water availability can mask the social and political realities of water availability on the ground, particularly the emotional, physical, and financial burden of securing water for different segments of society. Thus, reframing Pakistan's water challenge requires taking a debate on water availability focused on broad quantities and non-specific populations and recentering it on the specific people and places most affected by the challenge. The discourse should include both human (who is water secure?) and non-human (what sectors and uses get more water?) dimensions. This reframing will require eliciting people's perceptions and expectations of water and its availability, seen through the lens of their own gender, ethnicity, and class, to use as foundational building blocks for reinvigorating mainstream discussions on the issue.

There is also a need to go beyond scientific definitions of water quality indicators that often conceal the human costs of polluted water. Pakistan is on the list of the top ten countries globally with the greatest number of people living without safe water. While 90 percent of the country's drinking water is extracted from the ground, there is little emphasis on the relationship between water safety and health outcomes, or the broader quality of life. More than 90 percent of Pakistan's wastewater is discharged untreated into rivers and drains, contaminating surface water and groundwater resources. Participants underscored the imperative of exploring the health costs of poor water and sanitation due to both direct consumption of polluted drinking water and use of toxic wastewater in agriculture, especially in areas along the drainage network.

Water in Pakistan is also very much an individual's concern, despite the elaborate state bureaucracy that exists to govern this resource at federal, provincial, and local levels. The Supreme Court of Pakistan recognizes the human right to life that includes the right to safe drinking water, yet most people in the country are left to fend for themselves when it comes to securing water for drinking and other needs. Public infrastructure for access to safe water is limited and ailing. The inability of the state to protect its people by providing them access to clean water and sanitation has already created a space for the private sector, for instance in the form of water extracting corporations or informal water suppliers, to provide the same services for a price. The city of Karachi already operates under de facto private water delivery, with only a few neighborhoods having dependable access to public water. The physical, emotional, and financial burden of securing water rests with individuals, whether it involves physically travelling distances to fetch water, purchasing water through the tanker mafia, or installing the pumping infrastructure to access subsoil water. This burden needs to be highlighted and resolved in the framing of Pakistan's water challenge.

Beyond the individual's burden of securing water, water must also be perceived as a provincial, rather than national, resource. Despite support pledged by the National Water Policy of 2018 for improved water governance in the country, some participants stressed that, constitutionally and legally, water is a provincial resource—both irrigation infrastructure and water governance arrangements are vested with the provinces. The conflation of national and provincial responsibilities of water over time has led to a lack of clear ownership and responsibility for water provision. Recentering focus on the provincial identity of water governance could be critical for reducing tensions between provinces and enabling them to deliver jurisprudence on water.

Finally, Pakistan's water challenge needs to be embedded within a wider focus on the country's economic future and anticipated structural changes to the economy going forward. The agricultural sector, which uses 90 percent of available water, has historically been the backbone of the economy. However, as the country develops and diversifies into higher value-added agricultural manufacturing,

the sectoral allocation of water for agriculture and its productivity will need to be reconsidered. When the economy undergoes structural changes away from agriculture, water pricing will be a key determinant of future water usage. Participants emphasized the connection between water and the wider economy with respect to anticipated structural shifts and the need for policy makers and politicians to rethink the role of agriculture in the economy going forward.

Climate change is the principal water issue

Climate change, particularly for Pakistan, is a key issue affecting the availability, timing, and variability of supply of water resources. Pakistan has persistently ranked in the top ten countries worldwide that are most affected by climate change. Climate change is also severely impacting other water-nexus issues, including energy, food, and the wider environment. In Pakistan, governance and institutional infrastructure dealing with climate change and water have historically operated in separate silos. Given the urgency of climate change and its intensification of the water cycle, as highlighted in the recent Intergovernmental Panel on Climate Change's (IPCC) Climate Change 2021 report, participants emphasized the need to rethink and realign governance of water-related issues in order to be appropriately responsive to the effects of climate change.

Participants further discussed the necessity of studying the political economy and environmental justice implications of climate change and environmental degradation on local communities. Pakistan, out of all the countries in the Hindu Kush Himalayan region, has the largest settled area that is also home to the largest non-polar complex of glaciers. With over 51 million people settled in the Khyber-Pakhtunkhwa, Azad Kashmir, and Gilgit-Baltistan regions, Pakistan is at special risk from the rapidly melting reserves of freshwater in this region, and is thus uniquely situated to work to mitigate those risks for itself and the surrounding region. One area where this work can be done is in regard to deforestation, as the rapid scale of this practice in northern Pakistan contributes to climate change and its resulting effects on water availability. The effects of deforestation on local communities, and the political economy of timber mafias and other extractive groups operating in the region, has not yet been well documented.

Participants also underscored that effort should be made to understand and better integrate the effects of climate change for Pakistan's water-energy nexus. Given the importance of large hydropower projects in the country's energy mix, climate change will necessitate an investment in climate resilient infrastructure. At the same time, methane emissions from large reservoirs integral to lauded green energy projects need to be addressed in mainstream discussions on water and climate.

Generally, the centrality of the environment in the use and management of Pakistan's water resources needs to be emphasized. Notwithstanding the lack of agreement between provinces on the quantum and frequency of releases to the Indus River Delta, studies estimating environmental flows to the delta are dated and do not adequately estimate risks to the ecological health of ecosystems, especially in the context of various climate change scenarios. More importantly, sustaining the delta in its entirety cannot be achieved through simply ensuring minimum environmental flow on the Indus—it requires a look into irrigation and land-use practices in parts of Thatta, Badin, and Sajawal. Land use changes in the Indus Delta are affecting groundwater extraction and contribute to sea intrusion. An increase in the number of sugarcane plantations and associated sugar mills in the delta area, which release untreated effluent into natural drains, has further damaged the ecological health of the region.

Cities are now at the forefront of Pakistan's water challenge

Pakistan has the highest rate of urbanization in South Asia. Water insecurity is both the cause and the effect of high urbanization rates in Pakistan—while water insecurity and climate change contribute to rural-urban migration, the lack of access to safe, potable water sources also means large parts of urban populations become water insecure.

Participants underscored that urban water quality and sanitation issues are at the forefront of the country's water challenge. Dilapidated sewerage infrastructure in most Pakistani cities, and the resulting contamination of drinking water, results in about 100,000 deaths a year due to water borne diseases. Polluted groundwater, which is the most common source of potable water in urban areas, also has direct impacts on children's health outcomes, most notably stunting rates. These dimensions of urban water insecurity are, unsurprisingly, unevenly distributed among population groups, with issues most prevalent in informal settlements and slums.

The urban flooding challenge in Pakistan's cities is also likely to be exacerbated by climate change. More intense

urban flooding in cities like Karachi is expected to occur in the future in flood prone areas as more frequent and intense periods of precipitation occur due to shifting monsoon patterns. Participants stressed the need to address weak administrative and operational infrastructure in Pakistan's megacities, poor solid waste management, and inadequate urban drainage systems in order to mitigate the urban flooding challenge.

The size and complexity of the municipal water problem is not uniform across Pakistan's cities. The type of aquifers underlying cities, access to canal water, land use patterns, and water quality and depth all vary between cities and even within any city itself. While the challenges of urban water security in bigger cities like Karachi, Lahore, Islamabad, Multan, and Faisalabad are more complex and dominate urban water challenge discourse, there are opportunities for smaller cities to pilot projects that could become success stories and models for urban water delivery. Refocusing efforts to address the urban water insecurity challenge on secondary and tertiary cities, some of which have had the highest rates of urbanization in the last two decades, will allow for the development of practicable, scalable models of urban water security.

Water governance must be reimagined

A key theme in the roundtable discussion was the problem of water governance. Pakistan's water governance system operates through state institutions, but perhaps more importantly also through the apparatuses of wider society. Participants underscored the need to take mainstream discussions of water governance beyond the limited notion of governance by the state to consider the roles of non-state governors of water. These include but are not limited to international organizations, multinational companies, informal service providers, water lords, and end consumers. While state institutions are critical for water governance, harnessing the power and politics of non-state actors would allow a more holistic understanding of the true complexity of water governance and the end it serves. The reframing of Pakistan's water challenge necessitates a people-centered approach and an appreciation of the politics of everyday water security in which informal water governors play a key role.

Discussions of the formal governance of water also need to address overlapping mandates and clearly map responsibilities for water governance at the national and provincial levels, as well as among various entities at these levels. For example, at the federal level, the Water and Power Authority Act of 1958 gives the Pakistan Water & Power Development Authority (WAPDA) control over groundwater in any province. At the provincial level, the 2006 Amendment to the Canal and Drainage Act of 1873 gives the Punjab Irrigation Department the authority to monitor and regulate groundwater, yet in practice the department does not perceive groundwater governance as its key responsibility. At the local level, Public Health Engineering Departments (PHEDs) in rural areas and Water and Sanitation Agencies (WASAs) in cities develop and manage water supply schemes based on groundwater, but do not take responsibility for groundwater governance. The lack of clearly delineated responsibilities for water resource governance and overlaps between jurisdictions and mandates of state bureaucracies for managing water often hinder the effective management of water issues.

The lack of coordination and cooperation between departments concerned with water resource management is also a key governance issue. Historically, water resource governance in Pakistan has existed in silos with little coordination between federal and provincial departments for managing irrigation, agriculture, industry, the environment, disaster management, and climate change. Policy coordination across these departments needs to improve to strengthen capacity and enable integrated water resource governance in the country.

The role of international development and finance organizations shaping water governance should also be probed. The water sector in Pakistan has received massive loans and grants for technical assistance, improving water governance, and the support of water resource development since the early post-colonial period from international organizations such as the World Bank, the US Agency for International Development (USAID), and the Asian Development Bank (ADB). It is necessary to evaluate the impact of the last seventy years of assistance from international organizations so that future interventions and programs can be better designed to address lingering problems.

Finally, the pricing of water will be a critical aspect of reimagining water governance in Pakistan. Historically, water has been an underpriced resource in the country. The pricing of water for agricultural, industrial, and municipal use ultimately determines what crops are grown, how much water is used, and how much virtual water embedded in goods is exported. Participants stressed the critical importance of engaging various stakeholders in the water pricing debate before provincial acts are implemented. It is also important to consider the equity implications of water charges, as well as how new

provincial legislation will affect the myriad water service providers already operating in the informal economy.

Going forward

In a reframing of discussions about Pakistan's water challenge, people must be at the center. Historically, policy priority for water resources has focused on water-for-agriculture and water-for-energy. Going forward, these long-entrenched priorities must give way to a focus on water-for-people. Understanding the experience of the average Pakistani and the physical, mental, and financial cost of securing water should be captured and documented. To this end, some research initiatives in Karachi have endeavored to collect data to understand water consumption and water rationing at a household level, but more data needs to be collected to understand everyday water security for the average Pakistani across rural, urban, gender, class, ethnicity, and location dimensions.

Recentering the pursuit of knowledge around water issues from top-down, engineering-dominated solutions and average flows toward the promotion of local knowledge of specific populations and locations will be instrumental in putting people back at the heart of the water security debate. The bulk of water research considers too big of a picture, emphasizing modelling of irrigation systems and optimizing water flows for system-wide improvements. While some abstraction is necessary for macro planning, there is a need to collect data on the decision making and water rationing happening at the micro level. What kind of water management decisions are made by an average farmer? What is the financial burden of buying water (from formal and informal sources) for an average farmer or an average household? How do the costs of different modes of water access vary? How does household water demand and rationing vary according to income, locality (both within and among cities), and between rural and urban areas?

Attention must also be paid to how technology could enable Pakistan to become a twenty-first century, state-of-the-art water governing country. Precision agriculture technologies, such as moisture and electrochemical sensors, are being used worldwide to enhance water productivity in agriculture. While these offer the promise of a better water future, the equity implications of these technologies must be explored. In order to make holistic progress, it is imperative to enable technologies to work not just for large agri-businesses but also the myriad small farmers who cultivate most of the farmed area in the country. Scaling up any technological interventions should first consider the viability and affordability of use for the average small farmer.

At the institutional level, there is an immediate necessity to realign state institutions and reorient them from a long-standing pattern of managing abundance to managing scarce water resources effectively. Water experts and other stakeholders should also engage with recent provincial legislation on water and support effective roadmaps for their implementation, especially from an equity perspective. Provincial water acts envision the introduction of undertakers for water service provision and regulators of consumer interests within the purview of existing provincial irrigation departments. However, participants stressed that there is considerable institutional path dependency and inertia when it comes to state institutions taking on additional responsibilities and it is therefore critical to engage with new provincial legislation to ensure water justice for the average Pakistani. Going forward, coordination among institutions for water governance and a clear demarcation of their roles is critical for integrated water governance in the country.

Conclusion

The roundtable discussed key dimensions of Pakistan's water challenge not generally featured in mainstream discourse on the country's water scarcity. The broad consensus was that a new framing of the water issue, one that is holistic and people-centered, is required. In line with this framing, the historical manner of governing water in Pakistan will have to be reimagined in order to realign water governance to deliver water security for the people. As a step toward this vision, efforts should be made to build capacity in the water sector to displace existing entrenched actors, predominantly engineers, who advance and perpetuate their hegemony on mainstream discourse with a narrow focus on water scarcity and dams. The range of considered expertise on water should be expanded to consciously include professionals, especially women, who can build on (local) knowledge of the political, social, and justice implications of water insecurity. A renewed perspective on the country's water problem will reinvigorate mainstream discussions and highlight practicable areas for action, as discussed in the roundtable. The water problem in Pakistan is not unsurmountable given existing will to collaborate across provincial and societal lines.

About the author

Fazilda Nabeel teaches courses on the political economy of the environment within the School of Global Studies at the University of Sussex. Her research interests include transboundary water resource governance and hydro-diplomacy in the Indus Basin, as well as the local political ecology of groundwater governance in Pakistan. Fazilda has consulted widely for the Government of Punjab and international agencies on a breadth of policy issues in the water-environment-development nexus.

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This private roundtable was conducted with the understanding that no information from the discussion may be attributed to the relevant speaker(s). Attendees participated in their personal capacities. Affiliations are listed solely for identification purposes.

Dr Fazilda Nabeel served as rapporteur.

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