MERCY CORPS

CRISIS ANALYSIS
AFGHANISTAN

# KABUL'S WATER CRISIS

## An Inflection Point for Action

APRIL 2025

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# EXECUTIVE SUMMARY

In 2025, Kabul faces a severe and multi-faceted water crisis that, if left unchecked, will soon pose an existential threat to the city's roughly 6 million inhabitants.

The numbers are dire—Kabul's aquifer levels have plummeted 25-30 meters in the past decade, with extraction exceeding natural recharge by a staggering 44 million cubic meters annually. If current trends continue, UNICEF projections indicate Kabul's aquifers will run dry by 2030, potentially displacing 3 million residents. The same UN projections indicate that nearly half of Kabul's boreholes—Kabul residents' primary source of drinking water — are already dry. Over 120,000 unregulated bore wells—alongside hundreds of factories and greenhouses—are draining Kabul's 3 main aquifers at nearly double the rate that they can be naturally replenished. Kabul's population explosion from less than 1 million in 2001 to roughly 6 million residents in 2025 has fundamentally transformed water demand patterns within the city, and drastically increased pressure on the city's vital water resources.

Climate change has significantly increased severity and exacerbated this crisis. Afghanistan's climate and location make it highly drought-prone—the most recent drought, which ran from 2021-2024, impacted more than 11 million people. Climate shocks have significantly reduced precipitation across the country, including in vital catchment areas that feed Kabul's aquifers. Snow and glacier meltwater from the Hindu Kush mountains—the main source of Kabul's groundwater recharge—is becoming more scarce every year, and Kabul's groundwater levels have plummeted as a result. Between October 2023 to January 2024, Afghanistan received only 45 to 60 percent of the average precipitation during the peak winter season compared to previous years.

As much as 80% of Kabul's groundwater is contaminated with sewage, toxins, and dangerously high levels of chemicals such as arsenic and nitrates—contaminations that vastly increase the risk of disease, especially among children and the elderly. A lack of available clean drinking water has forced the closure of much needed schools and healthcare facilities across multiple suburbs of Kabul. For those without access to well water, the price of purchasing water has risen astronomically, placing additional economic stress on already struggling households. Some private water companies have capitalised on the situation, extracting large amounts of "public" groundwater from their own wells and selling it back to Kabul's residents at vastly inflated prices. Water access issues have exacerbated tensions within communities, as families vie for access to limited water from wells and pumps—in a 2008 Oxfam survey, 40% of respondents cited water issues as a primary cause of tribal and community conflicts.

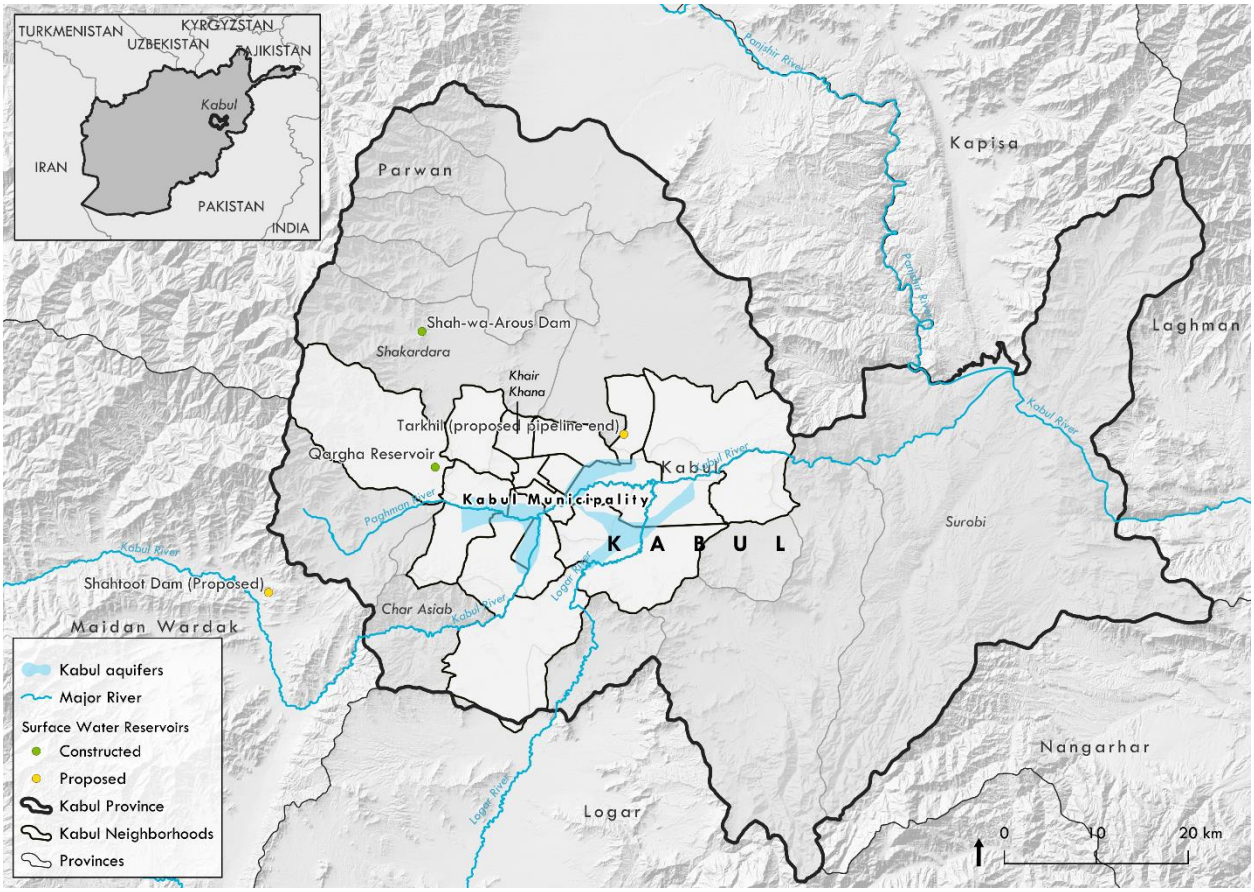
Governance failures, both pre-and-post 2021, have also accelerated the crisis. Despite two

decades of international humanitarian intervention, Kabul's existing water infrastructure remains woefully under-equipped to service the city's growing population. Decades of unregulated well-drilling have led to massive over-extraction and contamination of Kabul's aquifers, while critical surface-water reservoirs like Qargha Dam operate at significantly reduced capacity due to sedimentation and lack of maintenance.

International political factors have also impacted Kabul's water situation. The IEA's isolation on the global stage since August 2021 froze $3 billion in international WASH funding, crippling everything from infrastructure maintenance to community water education programs. The Trump administration's dismantling of USAID has already had a catastrophic impact on humanitarian programing across the country, including vital WASH related programing in Kabul and surrounds. Government funding shortfalls and a lack of private sector investment have also delayed critical water infrastructure projects like the Panjshir river pipeline and Shah Toot Dam, which, if completed, could help to alleviate Kabul's water issues.

Kabul's water crisis represents a failure of governance, humanitarian coordination, water regulation, and infrastructure planning. It is also a harbinger of climate-driven urban collapse, and the coming decade demands an unprecedented effort to increase Kabul's aquifer recharge and political solutions to revive frozen aid pipelines. Without immediate intervention, the city risks becoming the first modern capital in the world to fully deplete its water reserves - a disaster with far reaching humanitarian, political, and economic implications.

This report combines a range of primary and secondary sources with key informant interviews including with NGO staff, Kabul residents, and private sector and government employees. The aim is to provide an overarching picture of the scope, severity, and causes of Kabul's current water crisis, while also offering potential ways for the humanitarian community to engage on this issue and improve water security for Kabul's residents.




***Kabul's major water sources and key infrastructure*** *© Mercy Corps*

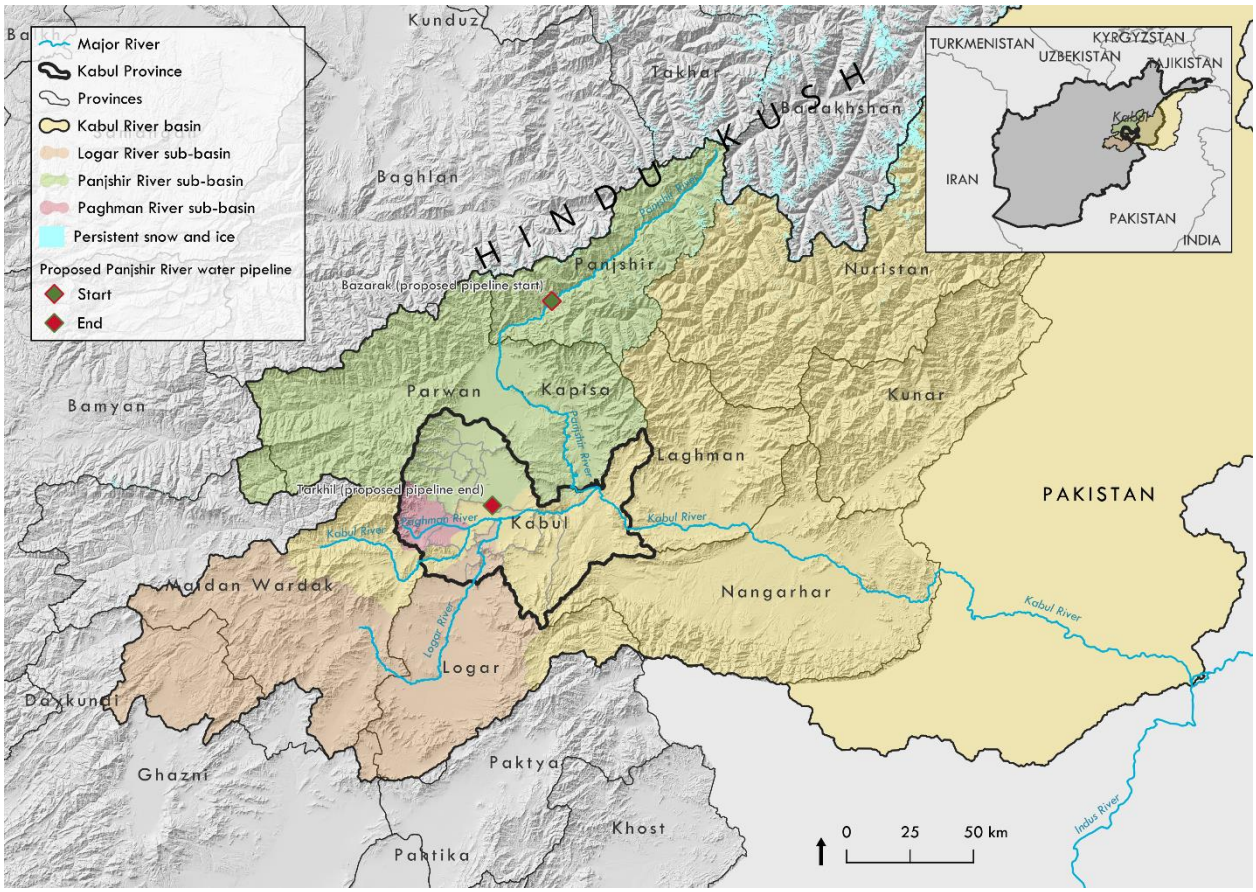
## Where Does Kabul's Water Come From?

Kabul is located in a wide valley, set along the southeastern flank of the Hindu Kush. Landlocked, and with no major inland bodies of water nearby, water access is one of the most critical issues for the city and its inhabitants.

The vast majority of Kabul's groundwater originates as melting snow and ice in the Hindu Kush mountains, which run in a roughly northeast to southwesterly direction along the city's western flank. The Kabul river basin comprises an area of roughly 1600 square kilometers. The basin is fed by the Kabul river and two of its tributaries—the Paghman river flows into the Kabul basin from the west, while the Logar river enters from the south. All three rivers are highly dependent on seasonal meltwater from the Hindu Kush, with the volume of flow up to 15 times higher in the peak spring months than in the winter.

Kabul's three main aquifers are recharged through a process known as "riverbed infiltration". As the aforementioned rivers flow deeper into the center of the Kabul river basin, water seeps through the basin's porous alluvial plains, and into underlying layers of sand, gravel, loam,

and clay. All told, these three aquifers have a combined volume of more than 5 billion cubic meters, many times the amount required to supply Kabul's population of roughly 6 million. However, because of groundwater over-extraction and slowed aquifer recharge as a result of climate shocks, only a fraction of this capacity is maintained.




***Kabul's water basins*** *©Mercy Corps*

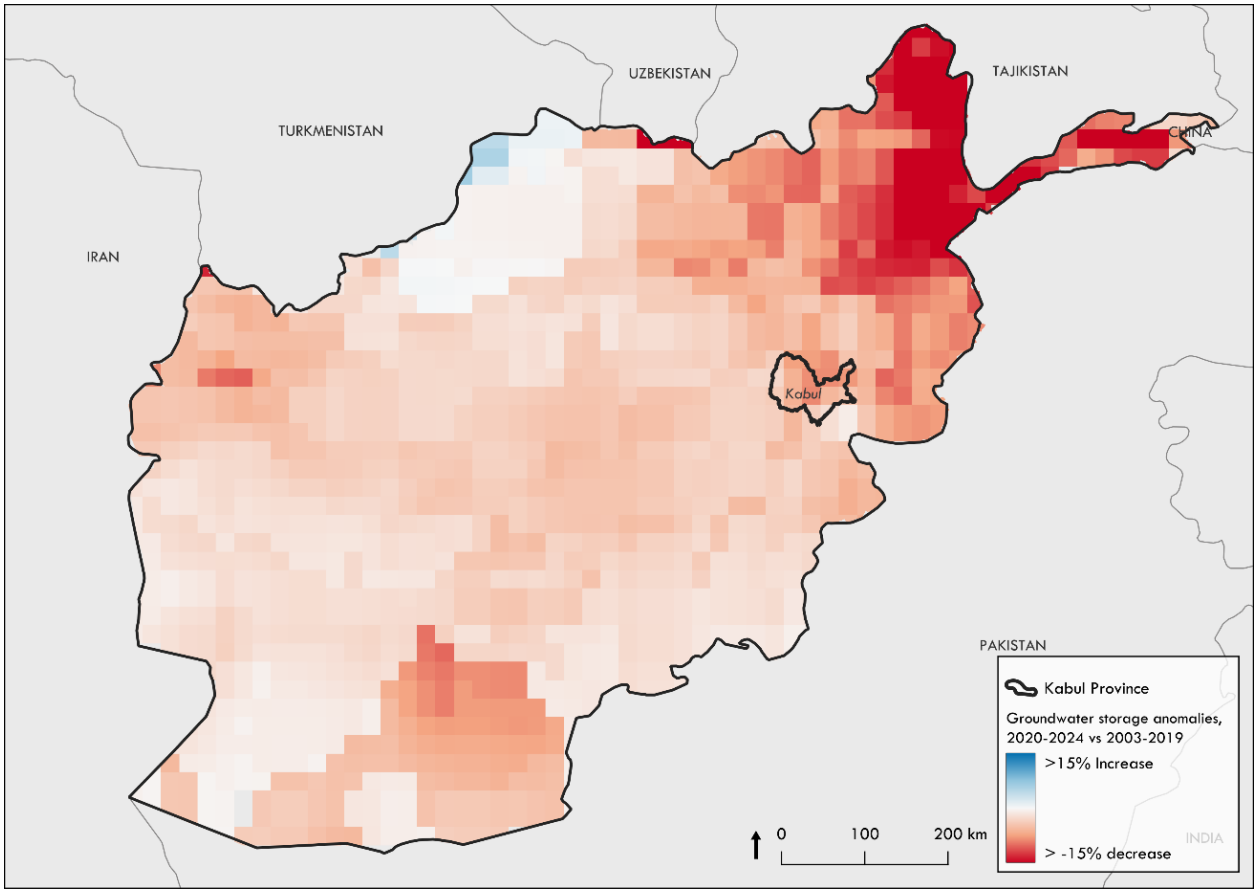
Surface water (i.e. water stored in dams and reservoirs), plays a relatively minor role in Kabul's water needs in 2025. However, several proposed water infrastructure projects including the Panjshir River Pipeline and Shah Toot Dam (discussed in more detail below) would significantly increase the role that surface water infrastructure plays in Kabul's water supply. Dams and reservoirs are used as a means through which to manage the temporal and spatial variability of water supplies and therefore reducing the need for groundwater extraction and alleviating pressure on the city's aquifers.

Direct precipitation also plays a relatively minor role in Kabul's overall water needs, given the city's location on an arid desert plain. Only a small fraction of Kabul's aquifer recharge can be directly attributed to precipitation falling in the area of the city itself. As a result of climate change, Kabul's levels of precipitation have steadily declined over the past two decades, and this trend is expected to continue. Kabul's rapid and sprawling urbanization, namely the paving of much of the city's surface area, has further decreased the ability of rainfall to be

absorbed and retained in permeable soil, rather than washing into gutters and back into the Kabul river as it flows east towards Pakistan.

## Impacts of Climate Change

For a city so heavily reliant on seasonal meltwater, climate change has been a critical driver of Kabul' water crisis. Afghanistan is the sixth most vulnerable country in the world to impacts of climate change, according to the Notre Dame Global Adaptation Index. It is also one of the least equipped to address the impacts of climate change globally, and is currently ranked 8/10 on the INFORM Climate Change Risk Index. Between 1951 and 2010, Afghanistan's mean annual temperature increased by 1.8c—nearly twice the global average. Much of the country remains in the grip of a severe drought, and nearly 40% of Afghan households lack sufficient access to clean water.




***Changes in Afghanistan's groundwater supply (2003-2024)[1]*** *©Mercy Corps*

[1] *This analysis uses the GRACE-DA (Data Assimilation for the Gravity Recovery and Climate Experiment) dataset, which spans from February 2003 to the present. It integrates data from the original GRACE mission (2002–2017) and its successor, GRACE-FO (2018–present), both of which measure changes in Earth's gravitational field to estimate groundwater variations, capturing data approximately every 3 hours. Groundwater storage is averaged over a 2003–2019 baseline and compared to the 2020–2024 average. The difference is then expressed as a percentage change for easier interpretation (raw changes are in millimeters). GRACE provides global coverage at a coarse spatial resolution (~25 km x 25 km), resulting in pixelated visuals, but still offers valuable insight into groundwater trends at national or regional scales—such as across Afghanistan.*

As a city reliant on melting snow and ice from the Hindu Kush for its groundwater, Kabul's water security has been seriously impacted by declining rates of snow and precipitation in these watershed areas—between 2014 and 2020, the levels of snowfall across the country reduced by nearly 20 percent. Shorter winters also mean less time for snow to accumulate on the Hindu Kush, and thus less meltwater runoff in the spring, even as the city's demand for water rapidly increases. A potential shift to a La Nina episode in 2025 could further worsen these dynamics. All of these impacts compound the general climate-related pressures on Afghanistan's economy, and thus on individual families. Despite living in Afghanistan's most populous and developed city, Kabul's residents face many of the same water-related challenges as those living in underdeveloped rural areas across the country.

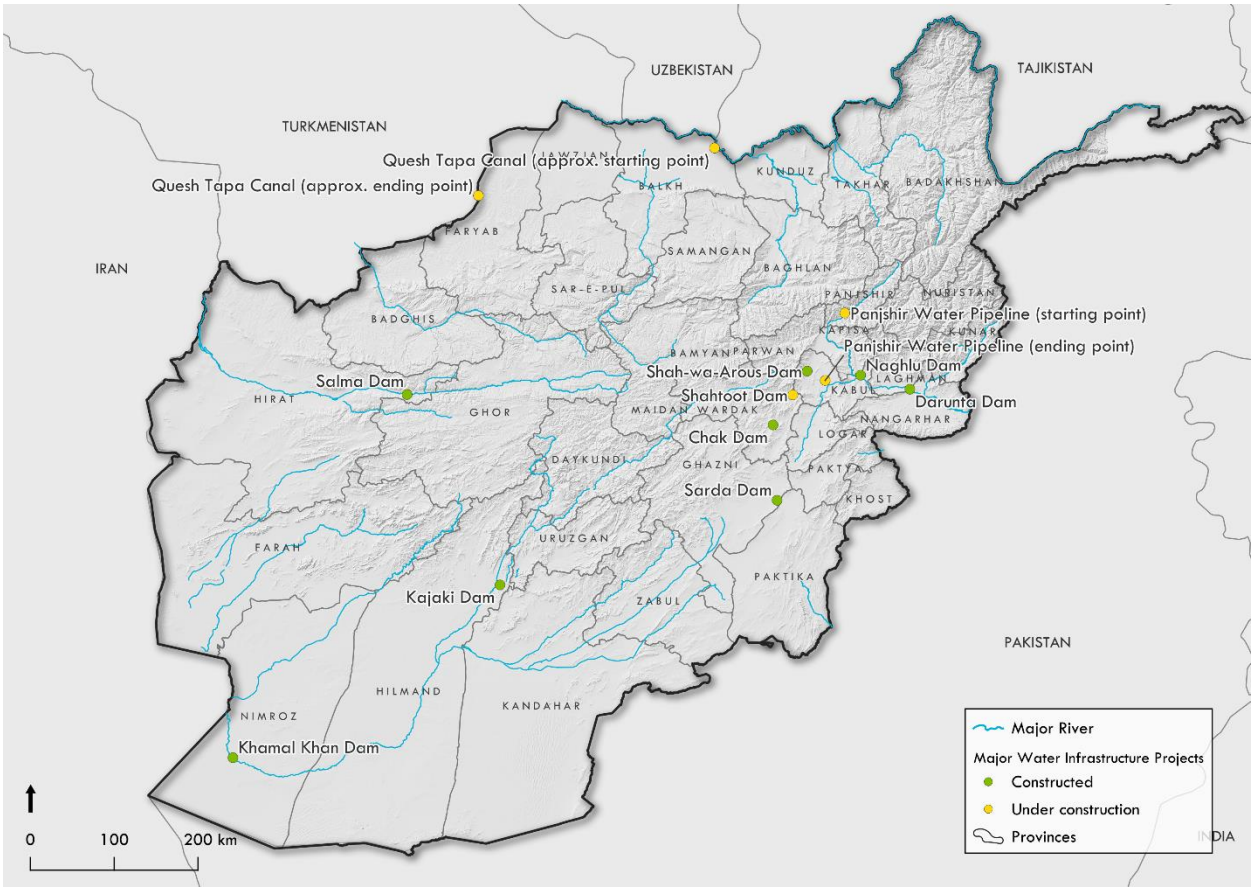
## Kabul's Water Infrastructure

Despite billions in international aid spent in Afghanistan over the past two decades, Kabul's water infrastructure remains woefully underdeveloped. Only about 20% of Kabul households are connected to piped running water from centralised sources, despite, among other projects, a $40 million grant approved by the world bank in 2006 that aimed to have at least 50% of Kabul households connected to a centralised water distribution system by 2010. For those who are connected to existing centralised water systems service is sporadic at best. Several households receiving directly piped water told MC that water only flowed for 2 or 3 days per week, within limited hours—similar to the electricity supply in many parts of the city.

Kabul's largest water treatment plant, located north of the city in the Baghrami industrial park, is a telling example of the failures of international intervention in Kabul's water infrastructure. Constructed by American firm Technologists, Inc., initial designs for the plant included a well house, pump house with booster pumps, underground water distribution pipes, two large reservoir tanks, multiple water pumps, and a comprehensive water treatment system. However, a 2016 report by the Special Inspector General for Afghan Reconstruction (SIGAR) found that only the water distribution pipes and several fire hydrants were ever constructed, forcing businesses operating in the industrial part to dig sewage pits themselves, and potentially contaminating groundwater. The report also found evidence of untreated wastewater from industrial factories flowing directly into nearby waterways, a problem that remains common in Kabul in 2025. Although the facility was updated in 2024, when the ICRC installed a set of booster pumps enabling the plant to supply water to roughly 250,000 residents in the area, it has never operated at its intended capacity.

A majority of Kabul's residents are undersupplied with water, averaging about 20 liters per capita per day (LPCD), compared to a recommended level of a minimum of 80 LPCD, and a rate of more than 200 LPCD for piped water from municipal systems in developed countries. 90% of Kabul's residents rely on water pumped from borewells to supply their daily needs,

while the remainder rely on water delivered by increasingly expensive and monopolistic private water companies.




***Kabul's major water infrastructure installments*** *©Mercy Corps*

Qargha Reservoir, 16 km west of the city, is a key piece of Kabul's surface water infrastructure. Built in the 1930s, the 30-meter-tall embankment dam spans 1.68 km across the Paghman river, storing 12 million cubic meters of water to irrigate 5,000 hectares of farmland in and around Kabul. Today, operated under the ministry of Energy and Water, the reservoir irrigates 2,000 hectares and supplies drinking water to Kabul's western districts. A 2023–2024 drought drastically lowered water levels, exposing sediment and reducing functionality. Although its sluice gates were rehabilitated in the 2000s, sedimentation issues persist, threatening long-term capacity of the reservoir. In 2023, the IEA government allocated roughly USD 67,000 for the dam's monitoring and maintenance, but the money was instead spent on refurbishing roads and tourism areas near the dam. A FAO-funded hydrological station, installed in 2008 by the World Bank and UN, monitors water quality and levels in the reservoir. Despite its age and state of disrepair, Qarga remains a significant piece of infrastructure within the city.

Kabul's newest piece of water infrastructure is the Shah-wa-Arous Dam, Inaugurated in

December of 2024. One of the most significant water infrastructure projects completed under the IEA administration, the $53 million dam is located roughly 22 km northwest of Kabul in the district of Shakardara, and includes a 78m tall, 250m wide dam wall and a 1.2 megawatt power generating station. At peak capacity, the dam is designed to provide 5 million cubic meters of additional drinking water to Kabul residents, enough to supply about 20,000 households, or roughly 2-3% of the city's population. In addition, the dam is planned to supply irrigation water to roughly 3.500 hectares of surrounding agricultural land. Like many major water infrastructure projects in Afghanistan, the Shah wa Arous Dam suffered many delays in its construction, and political and economic hurdles resulted in the project taking more than 12 years to complete. Construction was originally begun by Iranian firm Tablieh and Parhoon Tarh JV in 2012, and completed after the original contracts were renegotiated by the IEA.

A recently installed water filtration plant in Surobi District, 50 km east of Kabul, indicates what is possible regarding smaller scale, low cost water networks that feed directly into residents homes, eliminating both the need to travel to wells, and increasing hygiene through the use of closed piping systems. The project, funded by UNICEF and implemented by the Ministry of Rural Rehabilitation and Development, was completed at a cost of roughly $500,000, and provides potable water directly into 1,290 households in the area.

## Impact of Borewells

The vast majority of Kabul's residents obtain their waters from borewells, which became increasingly common in the early 1990s, as the city's rapidly expanding population overwhelmed Kharez and other traditional water sources. Households with limited financial means often tap into shared community borewells, while those that can afford drilling costs have household wells for private use. The widespread introduction of solar powered water pumps in the mid 2010s provided many households with an attractive alternative to expensive diesel-generator-powered pumping and painfully slow hand pumping from their wells. Solar pumps could operate 24/7, allowing round the clock water extraction with no manual labour. One of Kabul's first major solar-powered water pump projects was launched in 2014 with a pilot grid-tied Photovoltaic system, funded by Germany and implemented by Afghan company Zularistan Ltd. Though it only had a modest capacity of 3 kW capacity, this initiative validated the technical feasibility of solar pump applications in urban settings.

Although the introduction of solar powered water pumps was a boon to households, it also vastly increased the amounts of water being extracted from Kabul's aquifers. In the absence of widespread education around responsible water use, and without strictly enforced water use regulations, solar pumps enabled families and communities to extract far more water than they needed, without any short-term consequences. Old and poorly maintained storage tanks and pipes also contributed to large amounts of water being wasted once it had been

extracted from the ground. The ease with which families could now extract water increased the importance of household water storage capacity. This, in turn, highlighted a water-storage disparity between middle and lower income families— while some middle income families could afford dedicated, sturdy water tanks that kept water fresh and away from sunlight, many poorer families stored water contaminated with algae and microorganisms from being stored in cheap containers in the sun. Borewell regulation under the Taliban government of the 1990s was virtually nonexistent, and households and communities dug thousands of unplanned and unregulated wells across the city during this period to meet their growing water needs. Post 2001, the newly formed Islamic Republic government gradually introduced more drilling regulation, but enforcement was inconsistent. Under the IEA, businesses and households must, in theory, obtain licenses before digging new wells. However, in practice, enforcement remains patchy. In conversation with MC, several well drilling companies said that, while permits were required to drill, it was the customers responsibility to obtain permission, and drilling companies did not usually check before drilling. If wells are located too close to each other, contamination in one can easily seep into the other, resulting in a spreading network of contaminated wells. As more and more undocumented borewells are dug, the likelihood of unintentional cross contamination increases rapidly.

In February of 2025, Mercy Corps' Afghanistan Crisis Analysis Team conducted interviews with Kabul residents and drilling companies, to better understand the changing dynamics surrounding borewell use in Afghanistan's capital. The first clear takeaway was unsurprising—borewells are getting significantly deeper. Until the mid 2010s, borewells deeper than 100 meters were relatively rare, and wells could easily be dug with cheap, simple percussion drilling methods. In interviews conducted for this report, multiple respondents reported drilling up to 300 meters before reaching usable groundwater, often necessitating more technically advanced and expensive drilling methods. Deeper wells often require concrete or PVC sleeving to prevent the walls of the well from degrading and collapsing, further increasing the overall cost of the well.

Respondents gave a wide range of answers where the issue of drilling licenses are concerned, indicating widespread confusion about current legal and licensing requirements. Several small operators said that they operated without any license whatsoever, and said that no license was required on the part of the customer. Other operators said that drilling companies were required to obtain a license to operate, and could then drill without the customer requiring further paperwork. Yet other operators indicated that both they and their customers were required to have licenses and permission for any new wells. Government corruption and bureaucracy also compounds this issue. One driller told MC that, while the average time to obtain a new drilling license usually took upwards of two months, having government connections could bring this time down to two days.

More than half of all well-owned households that MC spoke to had re-drilled their well to increase its depth at least once in the past 5 years, while some had repeated this process up to 5 times. More than half of respondents also said that they had been forced to borrow money to drill their well. As Kabul's groundwater levels continue to fall, many of those with shallower borewells have been forced to either abandon their now-dry wells, or attempt to re-drill to increase the depth of their well. Multiple residents told MC that redrilling their wells had only led to an additional year or two of use, before redrilling was required yet again. In 2023, the UN indicated that 49% of boreholes across Kabul Province were already dry, and this number is likely to increase as the rate of drying wells outstrips the rate of new wells dug.

## Groundwater Contamination & Wastewater Treatment

Alongside water quantity issues, Kabul also suffers from severe and widespread water quality issues. A 2009 report conducted by the USGS found numerous contaminants, including boron, lead, selenium, and uranium in Kabul's groundwater at levels far exceeding WHO standards. Planned government and private sector development of mining projects in the Kabul river's watershed will only serve to exacerbate industrial groundwater contamination of Kabul's aquifers. Roughly 80% of the city's residents use simple pit toilets, which allow human waste to permeate directly into the soil and groundwater. In the absence of functioning city-wide sewerage and water treatment systems, raw sewage often flows from households into open drains and gutters, and then on to contaminate nearby waterways. With only sporadic government enforcement of environmental laws, many of Kabul's factories simply dump their untreated industrial waste into the nearest waterway.

MC spoke with residents across multiple suburbs of Kabul to assess current water quality issues. Many respondents said that the nearby dumping of sewage into ground pits had impacted the quality of their well water, and 70% of said that there were significant issues with the quality of their well water, including high salinity, discoloration, and bad tastes or odors. Others said that their wells were contaminated simply because they were located close to the banks of the highly contaminated Kabul river.

Alongside chemical and sewage contamination, groundwater salinity is a growing issue in Kabul. Afghanistan has generally high levels of salinity in much of its groundwater across the country, due to a combination of unique geology and low precipitation—close to 20% of nationally monitored wells contain higher-than-acceptable levels of salinity according to WHO guidelines. In Kabul, these naturally high levels of salinity have been significantly exacerbated by the constantly low levels of the city's aquifers. High levels of salinity render water unusable for drinking and agriculture, and often force the drilling of yet another new borewell. Groundwater salinity is also not uniform across Kabul—some areas like the former wetlands west of Kabul airport showing much higher levels, while other areas are within

acceptable ranges. This hyper-localisation of salinity issues means that, when the water in a well becomes brackish or salty, the most common remedy is to simply drill a new well nearby. This can lead to issues within communities and between households, when wells drilled close to each other lead to cross contamination. Many households report issues such as salinity or contamination from wastewater due to poorly managed septic systems near borewells. As a result, residents increasingly rely on bottled or purified water for drinking, further straining household budgets.

The National Environmental Protection Agency's (NEPA) directorate of inspections and control is the primary government body tasked with monitoring groundwater quality in Kabul and surrounding areas. However, the ministry's efforts are hamstrung by funding and technical limitations. Technicians at the directorate said that only 3 out of a total of 10 water quality metrics were able to be measured, due to a lack of access to reagents needed to complete the testing process. The technicians also said that when the ministry's water quality testing equipment broke or needed to be replaced, it was essentially impossible to access the needed international technical support due to the international communities freezing out of the Islamic Emirate government.

Water Quality monitoring is an area where many humanitarian actors are currently well placed to fill a gap in government capacity. As mentioned above, NEPA, the government agency tasked with water quality monitoring both in Kabul and around the country, lacks the capacity to undertake accurate and consistent water quality monitoring within the nation's capital—largely due to a lack of access to functioning and modern testing equipment. Several organisations, including DAACAR and UNICEF have, in the past published regular water quality reports covering Kabul, and have deep experience in this area. Greater coordination between government and humanitarian actors in this area could benefit both parties, and allow for more efficient decision making regarding which areas of the city would benefit most from water-related programming. Once problem areas have been identified, NGOs could increase communities' capacity to purify their own water through the use of bio-sand filters, and other low-cost solutions.

## Humanitarian and Economic Impacts

Water security is the ultimate cross-cutting humanitarian issue, impacting everything from health to education, economic outcomes, and social stability. As one of the poorest and most water-insecure nations in the world, Afghans across the country struggle to meet their most basic water needs. Water scarcity has already had critical impacts on Afghanistan's economy—the World Bank noted a 20.7% contraction in Afghanistan's GDP in 2021–2022, with water-related disruptions contributing to $1.2B annual losses in productivity.

Kabul's water crisis has had severe economic and humanitarian impacts on the city's

residents. In the medium and long term, the dynamics created by this crisis will only serve to perpetuate a self-reinforcing cycle of poverty, humanitarian strife and economic instability.

At the household level, a response to increased demand and scarcity, has resulted in a sharp rise in water prices. The cost of water supplied by trucks or private networks has increased by a factor of 2 or 3 in some areas of the city over the past five years, taking the cost of water from a predictable necessity to a significant burden on family finances. Many families now spend 15–30% of their monthly income on water, up from just 5% pre-2021, with private tankers now charging upwards of $5 per m³—12 times historic rates. In western Kabul's Khair Khana district, weekly water costs for a single household reach 400–500 Afghanis ($6–7), exceeding food expenses for more than half of households. To meet this financial burden, families are forced to borrow more, placing them deeper into debt. 68% of households incur water-related debt, with informal lenders charging 15–20% monthly interest.

Kabul's Agricultural sector has also been hit hard: Groundwater supports 80% of Kabul's surrounding farms, but plummeting yields have driven a 40% price surge in staples like wheat since 2021. The Qargha Reservoir—now operating at approximately half capacity due to sedimentation—has idled 12,000 hectares, threatening 500,000 agricultural jobs by 2025. Rising salinity levels also threaten to render irrigation water unusable for more than 400 greenhouses across the city and surrounds.

## Government Oversight

The IEA government has repeatedly emphasised that addressing Afghanistan's water management issues is a critical priority. High level government officials including Mullah Abdul Ghani Baradar and Sher Mohammad Abbas Stanekzai have publicly spoken on the issue, acknowledging the severity of Afghanistan's current water issues. However, while several key water infrastructure projects (most notably the Shah-wa-Arous Dam) have indeed been completed under the IEA, the implementation of new policies has not kept pace with the rhetoric. While the IEA has inherited much of the technical staff of the previous government, it has also largely maintained the same water management policies and internal bureaucratic structures. The IEA has also publicly pushed back against claims that Afghanistan continues to suffer from severe water issues. In a recent example, following a post by the ICRC for world water day in March 2025, a spokesman from the Ministry of Energy and Water said that the ministry "completely reject[s] the Red Cross's report suggesting that 33 million people in Afghanistan lack access to water."

Government management of Kabul's water infrastructure falls primarily under the mandate of the Ministry of Energy and Water (MoEW), while water and environmental conservation policy is created by the National Environmental Protection Agency (NEPA). Both agencies have been heavily impacted by post-2021 losses of technical staff and capacity. In

conversation with MCA, a water engineer at the NEPA estimated that the agency had lost roughly 40% of its technical capacity since the change in government, largely due to technical staff fleeing the country. Although government officials often minimize the outward-facing impact of this brain-drain, staff within several water-related ministries indicated to MCA their concerns that this loss of technical capacity has had a significant impact on the ability of these ministries to effectively and efficiently implement new water related planning and infrastructure projects.

## Trans-Boundary Issues

Water policy remains a highly political issue, especially where trans-border water access issues are concerned. Afghanistan is the site of headwaters for several key waterways that flow into both Pakistan and Iran, and also contains critical watershed areas for the Amu Darya river, shared with Turkmenistan, Tajikistan, and Uzbekistan. This positioning gives the Afghan government a source of significant strategic leverage over these neighbors. In 2021, former president Ashraf Ghani indicated rising regional water tensions with Iran, stating that Afghanistan "would not continue to provide water for free but would require oil in exchange for the Helmand river's flows". The IEAs completion of water infrastructure projects like the Khamal Khan dam in Nimruz, have further elevated these tensions. In the north, the Quesh Tapa canal project is predicted to divert up to 25% of the Amu Darya's flow, significantly impacting a critical water source for Afghanistan's northern neighbours.

This political and economic friction is compounded by the fact that the IEA government has no formal legal water-sharing framework with any of its neighbors. 12 proposed, under-construction, and recently completed water infrastructure projects along the Kabul river—including the Shah-wa-Arous Dam—are predicted to reduce the volume of the Kabul river's water reaching Pakistan by as much as 16%. This reduction would have significant humanitarian and economic impacts across provinces in western Pakistan that rely on water from the river to irrigate thousands of hectares of agricultural land, and as a main source of drinking water. The proposed Shah Toot Dam project, which would be located 30 km southwest of Kabul, emerged as a significant point of political contention between Afghanistan and Pakistan, as early as 2012, when a feasibility study for the project was first completed. India's pledge in 2021 to fund the project elicited Pakistani accusations that India and Afghanistan were collaborating to limit Pakistan's access to surface water.

The IEA's relations with Iran have also been plagued by water-related border hostilities, much of it related to the recently inaugurated Khamal Khan dam in Nimruz. While recent visits by the Iranian Foreign Minister indicate that both sides hope to foster closer economic ties, significant tensions still exist, and no formal water-sharing framework has yet been proposed. Clashes in between the IEA and Iranian border forces in May of 2023 demonstrated the extent to which tensions had risen, undergirded by broader, longstanding water sharing

issues between Afghanistan and Iran—issues that have also been significantly compounded by climate change and falling groundwater levels. In this sense, the issues surrounding the Khamal Khan dam and Helmand River in southwestern Afghanistan may offer a glimpse into the type of water-related dynamics that could develop between Afghanistan and Pakistan.

The IEA's campaign of major water infrastructure projects across the country will continue to have significant political repercussions for Afghanistan's relationships with its neighbors, has thus far shown that it is willing to complete large-scale infrastructure projects despite pressure from its neighbors, these trans-border political considerations are likely to play a role in any new infrastructure plans that could potentially alleviate Kabul's water issues.

## Humanitarian Coordination & Data Sharing

Humanitarian actors have been working to alleviate Kabul's water issues for decades. From building new piping infrastructure, digging wells, testing water, installing solar pumps, providing water storage tanks, and providing water-conservation training, actors in the humanitarian sector have attempted to address this issue from a myriad of angles. Despite this long history of numerous actors working on the same issue, the humanitarian sector's approach to water related problems in Kabul is still plagued by a lack of overarching coordination and a historic 'projectized' approach. During the process of drafting this report, several NGOs told MCA that they felt hesitant to share information with other NGOs that could be mutually beneficial, due to fears that information-sharing would not later be reciprocated. Some organisations also mentioned the increased competition for shrinking amounts of overall donor funding for Afghanistan as another reason for hesitancy in this area—a dynamic that has been exacerbated by the recent USAID funding freeze.

Compounding this is the fact that there is relatively little recent primary research relating to Kabul's current water crisis. Afghan academics, particularly those now based outside of Afghanistan, have contributed the most new literature in this field, especially post-2021. Many of the American and European technical surveys that provide commonly cited facts and figures for Kabul's water usage were undertaken before 2015. In some cases, recently published reports on Kabul (and Afghanistan's) water issues cite statistics that originate in the early 2000s.

Data-sharing is an issue across the entire humanitarian sector. While bodies like the WASH cluster and Afghanistan Water Access Platform (AWAP) have been established to foster increased inter-organizational coordination, there remains no centralised and standardized repository of data for water related issues, whether it be for water quality data, market price fluctuations, or meteorological data. On the government side, a national climate change information database was established in 2019 with funding from the Green Climate Fund, but staff at NEPA told MCA that access to the system was withdrawn after the change in

government in 2021, giving current government workers no way to log on to the system and either view or register new data. As of March 2025, this system remains dormant and unused. Many of the existing technical surveys of the Kabul basin's hydrogeology are 15 years old or more, and there is a distinct lack of up-to-date primary source research regarding the water use habits of Kabul's residents, and factors such as household water storage capacity and borewell drilling and use. If Kabul's water infrastructure is to be modernised and improved, a comprehensive study of the city's disparate and disconnected community water networks is needed to identify gaps and areas of greatest need.

Government bureaucracy remains a significant impediment to implementing any form of humanitarian programming in Afghanistan, even in relatively uncontroversial areas like WASH programming. In dealing with government ministries, organisations often face months of bureaucratic hurdles simply to reach the stage where MOUs for new programming can be signed. Recent pressure by the IEA against INGOs has added further time and bureaucratic hurdles to these processes.

## Impacts of Funding Freezes

The precipitous decline in humanitarian funding for Afghanistan since August 2021 has significantly impacted programing for water-related issues. In early 2025, OCHA announced that implementing partners had received only 8.4 million out of the $264 million required to implement planned WASH programming across the country. The US administration's recent move to terminate more than 90% of all USAID funding has significantly compounded this issue, placing many NGOs operating in Afghanistan in an untenable position. With only 11.6% of Afghanistan's Humanitarian Needs and Response Plan funded by early February 2025—and 74% of those funds committed by the now-frozen US aid—this development has already catastrophically impacted the scope and scale of humanitarian programming in Afghanistan. Although some waivers have been issued allowing "life saving humanitarian assistance" to continue, more than 50 humanitarian organisations have already been forced to to partially or fully halt their programing in the country. The freeze has also resulted in the suspension of many Third-Party Monitoring (TPM) contracts and activities, limiting the ability of organisations to oversee and ensure the quality of remaining water-related programming. Critical coordination mechanisms have also been shuttered due to the funding shortfall. In early February, iMMAP announced that it would temporarily suspend ReportHub, a dashboard that facilitated data-sharing and coordination between 120 humanitarian actors in Afghanistan, including all members of the WASH cluster. With nearly 50% of Afghanistan's population reliant on some form of WASH funding, the water-related impacts of this USAID/BHA funding freeze and Stop Work Orders have already been far reaching, and much of the WASH programming across the city is now on hold. In the absence of a clear resolution to this freeze, and against the broader backdrop of diminished funding for Afghanistan,

humanitarian actors will have to adopt new and creative approaches to addressing Kabul's water crisis.

# Proposed Solutions

*Humanitarian and Development Solutions*

Between 2002 and 2021, more than $4 billion in international development funds were allocated to Afghanistan's water sector, according to the World Bank Although Kabul's water infrastructure remains severely underdeveloped, significant efforts to improve it have been made in the past. GIZ's Water Sector Improvement Program ran from 2008-2021, while another German NGO KFW operated the Kabul Urban Water Supply Project from 2017-2020. While both projects made headway developing Kabul's water treatment and infrastructure capacity—including the construction of pumping stations, piping networks, and small-scale water treatment facilities—these types of projects are unlikely to be repeated given recent and severe funding shortfalls. In the absence of significant funding boosts, increased engagement with the private sector may offer a sustainable way forward where Kabul's water needs are concerned. Regulation is a specific area where NGOs could have an immediate impact, helping to draft laws and frameworks ensuring that any actors providing water to the public do so in a safe, efficient, and sustainable way. Kabul's lack of basic water infrastructure is also one of the key factors limiting the ability of the government to implement and standardize water regulation across the city. With so many private, undocumented wells dotted across the city, it is not feasible for a centralised body to monitor the water use of the vast majority of households. Expanding Kabul's water piping network would have a twofold benefit. Firstly it would allow clean, safe water to be delivered directly to homes, lowering the health risks of consuming tainted water faced by many of Kabul's residents. Secondly, an expansion of the centralised water network would allow for accurate centralised monitoring and regulation of household water use. In addition to this, NGOs could would with private sector actors to boost efficiency and cost recovery, allowing these actors to provide and maintain this infrastructure in a more efficient and sustainable way, ideally without support from the development and humanitarian sector

A multi-sectoral approach, encompassing the nexus of water, food, and energy security issues, could also offer a more efficient path forward. Broadening the mandate of "water security" programming could also help to entice private sector partners. Initiatives such as the Asia Development Bank's Managed Aquifer Recharge project offer a model that could be expanded to encompass private sector participation. This could be implemented across multiple domains, from increasing communities' capacity to monitor and manage their own water supplies, to encouraging legislative and regulatory reforms.

Humanitarian and development actors could also help to facilitate private sector investment in government-instigated water infrastructure in multiple ways. One approach could be to

utilise these actors' technical capacity to help draft pre-feasibility studies for proposed infrastructure projects, thus reducing the perceived initial investment risk to those in the private sector. Humanitarian actors could also work to increase the technical capacity of the private sector through technical training and professional development programs, empowering Afghan water-related businesses to work more effectively and efficiently, especially at the level of local infrastructure development. Specifically, increasing the private sector's capacity to construct critical infrastructure like pump houses, filtration systems, and modern piping networks would go a long way to enabling private sector actors to play a productive role in addressing Kabul's water crisis.

In terms of regulatory frameworks, humanitarian and development actors could, in theory, work to draft standardized public-private partnership agreements that protect both public interest and private investment, and increase confidence on both sides. However, this approach would likely necessitate a higher level of mutual trust between the IEA and humanitarian actors than currently exists, and it's unlikely that the government would allow humanitarian actors to act as a sort of go-between with the private sector. The current level of distrust between the IEA and many humanitarian and development actors is a significant hurdle to implementing new projects and programming in this domain, as it is across the humanitarian sector in Afghanistan.

*Infrastructure Solutions*

Major water infrastructure projects could go a significant way towards alleviating Kabul's water crisis, if adequate governance, regulation, financial, and cooperation frameworks are put in place. As of February 2025, the IEA has plans at various stages of development for several such projects. Although many of these projects were originally proposed under the previous government, the IEA has pushed hard to highlight the cases where they have succeeded in completing projects that were long stuck in limbo. Despite the completion of many smaller water-related projects in and around Kabul, including several check dams and small-scale water purification facilities, the largest and most important projects remain plagued by significant funding shortfalls and planning hurdles.

The Shahtoot dam is a major proposed dam and reservoir project, originally announced in February of 2021 as a joint venture between the Afghan and Indian governments. The dam, which is planned to be located roughly 30 km southwest of Kabul in Char Asiab district, would provide potable water to more than 2 million Kabul residents, and significantly increase groundwater recharge of the Kabul Basin. Feasibility studies for the project were conducted in 2012 by an Iranian firm, which estimated the budget for construction at $236 million. While construction was originally slated to begin in 2021, the change of government, land rights issues, and funding gaps pushed the proposed completion date back to 2027. As of March 2025, construction has not yet begun, and the project faces significant opposition from the

government of Pakistan, who assert that it will reduce the Kabul River's flow into Pakistan's western Khyber Pakhtunkhwa Province by 16–17%, jeopardizing irrigation for more than a million hectares of farmland.

The Panjshir river pipeline is another project that, if completed, could significantly alleviate Kabul's overreliance on groundwater and allow the Kabul Basin's aquifers a chance to recharge to healthier levels. This proposed 200k m pipeline would divert roughly 130 million square meters per year of surface water from the Panjshir river to supply 2 million of Kabul's residents with potable water. The project represents one of Afghanistan's most ambitious infrastructure initiatives in recent decades. Although the survey and design phases of the project were completed in late 2024, the project has yet to gain final approval from IEA leadership, and the government continues to seek additional investors to supplement the project's proposed $170 budget.

# Conclusion

Although Kabul's water issues have been growing more severe for decades, they have now reached a critical inflection point. A combination of man-made and environmental factors have significantly decreased the amount of seasonal fresh water flowing into Kabul's aquifers, even as over-extraction increases. The limited groundwater that is available to Kabul's residents is increasingly dangerous to consume, and threatens widespread health, social, and economic problems. The shifting dynamics surrounding Kabul's water issues reflect a complex interplay of economic pressures, environmental degradation, technological advancements, and social and political challenges. Recent shocks to Afghanistan's humanitarian funding streams have significantly magnified these problems.

Kabul's water challenges underscore the urgent and critical need for sustainable water management policies, investment in new infrastructure, and coordinated policies between government, humanitarian, and private sector actors. Without large-scale changes to Kabul's water management dynamics, the city faces an unprecedented humanitarian disaster within the coming decade, and likely much sooner.