Mohammad Assem Mayar

THE LONG WINDING RIVER:
Unravelling the water dispute between Afghanistan and Iran

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Afghanistan and Iran have been at loggerheads in recent months over the Helmand River and its water. With the region grappling with a punishing drought for the third year running, the two neighbouring countries have been locked in a tense melee over shared transboundary rivers. While Iran seeks to assert its rights over water from the Helmand River based on the 1973 Afghan-Iranian Helmand River Water Treaty, Afghanistan maintains that there is simply not enough water to provide Iran with a greater amount. AAN guest author, Mohammad Assem Mayar, looks into what has driven the recent dispute over water between these two countries and provides insights into the future prospects of water relations between the two nations.

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BACKGROUND

Water, more precious than gold, has historically played a significant role in the relationship between Afghanistan and its downstream neighbour, Iran. Disputes over who gets how much of it and when date back to when the British government established the border between the two countries 150 years ago. Looking at history, every water dispute between Iran and Afghanistan coincides with a drought period.

During the first Taleban emirate (1996-2001), for example, four years of drought in 1998-2001 reduced the water flow to Iran considerably, causing the Hamun (also spelled Hamoun) Wetlands to go completely dry.[1] This is a globally important ecosystem, where the Helmand River normally peters out into a complex of lakes and marshes stretching across the border. In 2000-01, however, local communities, both Iranian and Afghan, struggled to find water for themselves, their livestock and agricultural fields. The map in Figure 1 shows the Helmand River basin, the white dotted patches show the location of God-e Zerah and Hamun-e Puzhak. Dasht-e Nawar, located in northern Ghazni province, has not been marked as a wetland on this map.

Iran accused Afghanistan of blocking water flowing into its territory and sought the good offices of the United Nations in March 2001 and December 2002 (see UN Digital Library here and here). In a letter sent to the UN, Iran's then Permanent Representative, Hadi Nejad-Hosseinian, said that the blockage of water, which had started a year earlier (8 March 2000), had caused "enormous damage to the agricultural and animal husbandry of the people of the region," and had left local communities struggling to access drinking water. The letter went on to say:

> *[I]n a joint inspection carried out in Tir 1379 (July 2000) by two technical teams from Iran and Afghanistan to the Kajaki dam and the hydrometric station at Dehrawud, which is the base for the measurement of water in the Hirmand River, the two teams jointly concluded that the flow of water at the hydrometric*

[1] As well as the drought, there was a wider political context as to why tensions over water were so heightened at this time. In 1997, when the Taleban first captured Mazar-e Sharif from the Northern Alliance, which Iran supported, the Iranian consulate in the city was attacked. Eight diplomats and intelligence officers (some reports said 11) and an Iranian journalist were killed (see UN statement). Iran responded by deploying 70,000 troops along the Afghan border, with promises of 200,000 to come, and the Taleban countered with a deployment of 10,000 troops. In the end, there were no incursions. (See UN reporting from the time.)

station at Dehrawud was 46.8 cubic metres per second and that the Kajaki dam had 1 billion cubic metres of water in reserve. The inspection team also observed that the main cause of the water blockage was the closure of the gates of the Kajaki dam, which prevented the flow of water towards Iran.

Figure 1: The Helmand River, its tributaries, drainage basin and the location of wetlands

Source: Karl Musser, via Wikipedia, 3 May 2010.

At the time, Murray Wilson, a consultant for the United Nations Development Programme (UNDP), who had visited Iran and Afghanistan for a joint UN assessment mission in the waning months of the first Emirate, later spoke to IRIN News (now The New Humanitarian) and likened the Hamun Wetlands basin to a "dustbowl" (see here). In the piece, published on 25 September 2002, he added: "There is nothing coming down the river now. Everything has dried up." He predicted that the cities of Zabol and Zahedan in Iran's Sistan and Baluchestan province had only six months of drinking water left.

Wilson dismissed claims by Afghanistan that four years of drought had contributed greatly to the problem and stressed that there was "plenty of water. They're [the dams inside Afghanistan] absolutely full up." IRIN reported that Wilson's argument was supported by satellite photos of the Kajaki and Arghandab Dams near the Afghan city of Kandahar, where both dams were clearly full of water.

Wilson argued that the water behind the dams inside Afghanistan were key and called on the Afghan government to turn the water back on. IRIN quoted him, saying: "Every litre of water that comes down that river has a price on it – and in Iran its [sic] probably worth more than petrol in human terms.… Turn the water on and the whole area could come back to life."

Back in 2001-02, events overtook Iran's complaints to the UN. The end of four years of punishing drought coincided with the fall of the first Emirate in the wake of the US-led invasion of Afghanistan that followed the 11 September attacks, an invasion that Iran quietly supported.[2] With it, a new republican era was ushered in, leading

[2] Iran, which had been steadfastly supporting the Northern Alliance, played a critical role in the US-led invasion of Afghanistan, with "Iranian military advisors rubb[ing] shoulders with U.S. military personnel in the Northern Alliance areas. Tehran even said it would give sanctuary for distressed U.S. military personnel inside its territory," according to Mohsen Milani in a piece published by the United States Institute of Peace (USIP). In another paper, 'Iran's Policy on Afghanistan The Evolution of Strategic Pragmatism', published by the Stockholm International Peace Research Institute (SIPRI), Bruce Koepke wrote:

> *In the wake of September 2001, Iran provided extensive — albeit indirect — political, intelligence and logistical cooperation to the USA in an effort to oust the Taliban. US and allied special forces were first deployed to Afghanistan as Operation Enduring Freedom in October 2001 with Iran offering considerable assistance 'to allow American transport aircraft to stage from airfields in eastern Iran[,] … to perform search-and-rescue missions for downed American airmen … [and to allow] an American freighter packed with humanitarian supplies to off-load its cargo' at an Iranian port.*

After the fall of the first Emirate, Iran was a key player in the Bonn Conference and according to then acting US ambassador to Afghanistan, James Dobbins, "They brokered some of the key compromises that led to the success of the Bonn conference where the Karzai government was selected," and provided considerable assistance to bolster the pro-American Karzai government in Afghanistan." (See 'Iran: Reality, Options and Consequences, Part 2 – Negotiating with the Iranians: Missed opportunities And paths forward' transcript of the US Congress' Subcommittee on National Security and Foreign Affairs on 7 November 2007. (For a detailed and interesting account of US engagement with Iran in this critical time, see also James Dobbin's 2008 memoir 'After the Taliban: Nation-Building in Afghanistan,' in which he credits Iran's then Foreign Minister Javad Zarif with achieving "the final breakthrough without which the Karzai government might never have been formed".)

US President George W Bush's first State of the Union address in January 2002, in which he accused Iran of being part of "an axis of evil, arming to threaten the peace of the world," put the chill back into the thawing Iran-US relations.

to a reset of Afghan-Iran relations. Tensions over water, however, continued to simmer in the background and came to the fore again with the inauguration of the Kamal Khan Dam in 2021, which escalated into a war of words between Tehran and Kabul (more on this later).

With the current drought continuing to exact a heavy toll on the human and natural environment, the age-old dispute over water has once again taken centre stage. Iran complains that it has not been receiving its fair share of the Helmand water and has highlighted the damage done to its agricultural sector and the devastation of the Hamun Wetlands. Conversely, Afghanistan argues that decades of inadequate water management under successive ineffective governments, with water flowing downstream unchecked, have meant that Iran has been getting more than its share. Now, after three years of punishing drought, according to Afghanistan, there is simply no more water for Iran to have.[3]

This report:

- Examines the geographic and environmental nature of the Helmand River Basin and its vital importance to communities on both sides of the border and delves into the factors driving the most recent dispute between Afghanistan and Iran;
- Traces the history of the water dispute between the neighbours back to the late 19th century when the border was first established and looks into the various attempts to settle the issue since that time;
- Hones in on the existing legal frameworks, especially The Afghan-Iranian Helmand River Water Treaty (hereafter referred to as the Helmand Treaty), which is the only operative agreement defining how water should be shared and what Iran's rights amount to;
- Examines Afghanistan and Iran's attempts to secure additional water from the Helmand River;

[3] Iran's demands extend beyond the Helmand River and include water-sharing in the Harirud River, which flows from central Afghanistan through Herat province and forms part of the Afghan-Iranian and Iran-Turkmen border. However, since the Helmand River is the only transboundary body of water subject to a treaty between Iran and Afghanistan, it has been the focus of Iran's public stance about diminished water flows into its territory. In addition, Iran demands a share of the water from the Harirud river basin, which is of significant importance to its domestic needs, including drinking and sanitation for Mashhad residents. This water is supplied through a series of pumps from the reservoir of the Iran-Turkmenistan Friendship Dam.

- Looks at the divergent interpretations of the Helmand Treaty and why it has never been fully implemented in the half-century since it was signed.
- Concludes that the current dispute may ease in the short term if winter rains fall heavily as predicted. However, the climate crisis will bring more frequent droughts of increasing intensity to this region, putting more pressure on people and governments already struggling to balance water needs against diminishing water resources. This report presents some ideas as to how the impasse could be resolved, including some technological innovations and changes to water usage aimed at reducing demand.

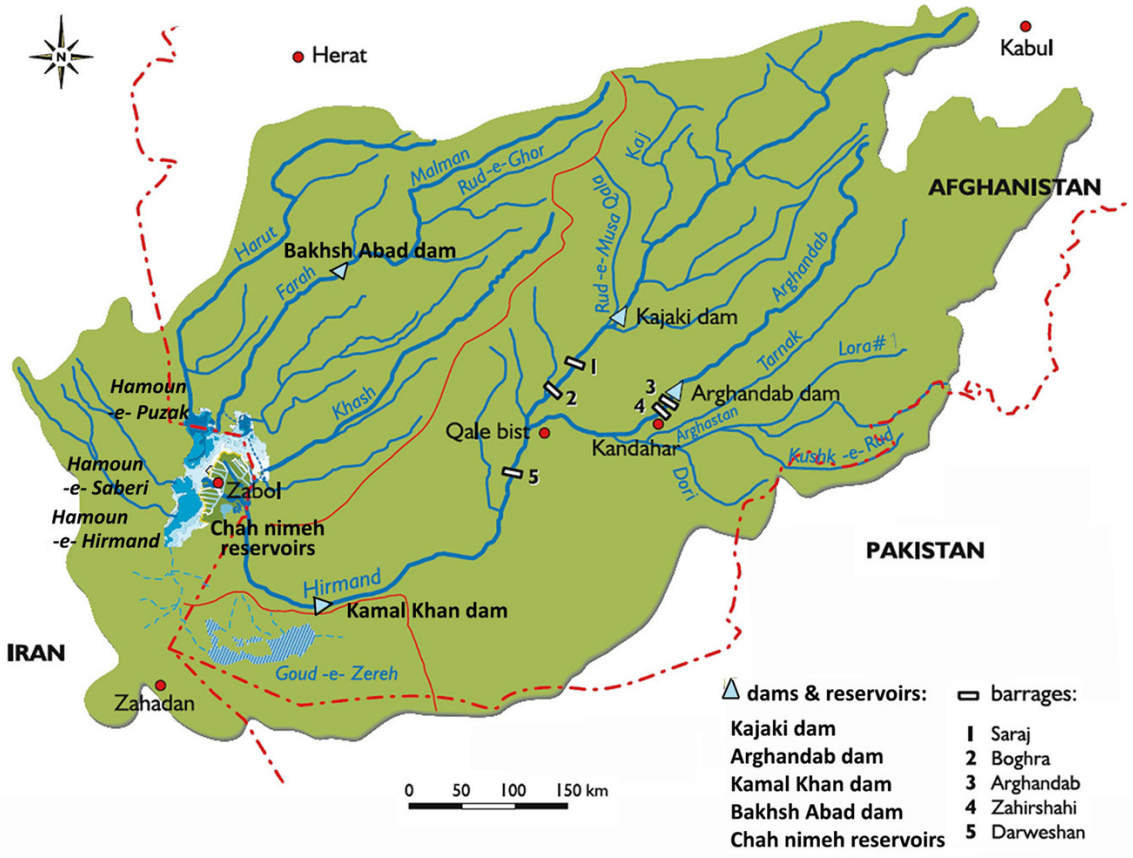
THE RIVER AND ITS WATERS

The Helmand River basin is a huge area encompassing approximately 45 per cent of Afghan territory and accounts for roughly 10 per cent of Afghanistan's water resources (see 'Afghanistan's Environment 2008' published by the United Nations Environment Programme (UNEP) here). Its primary river, the Helmand (also known as the Hirmand River in Iran), originates in Afghanistan's Hindu Kush mountains and stretches for 1,150 km from Wardak province through Bamyan, Daikundi and Uruzgan until it arrives in Dasht-e Margo, the vast plain that straddles Helmand and Nimruz provinces at the border with Iran. The catchment area of its southern tributary, the Arghandab River, extends from the eastern mountains of Paktia province. It joins the main river in Helmand province. Its northwestern tributaries – Khash-Rud, Farah-Rud and Harut-Rud – are smaller rivers originating in Ghor and Farah provinces. The waters of the Helmand River eventually cross the border and flow into the Hamun Wetlands, a vast region that covers Sistan and Baluchestan province in Iran and Nimruz, Farah and parts of Helmand provinces in Afghanistan (see figure 2).

Afghanistan and Iran are both characterised by an arid climate and face frequent water scarcity. In recent decades, climate change has led to more frequent and intense droughts, heatwaves and temperature rises, increasing the evaporation rate, particularly in the Helmand River basin. In the parched region that straddles Afghanistan and Iran, communities on both sides of the border rely on the water from the Helmand River for the survival of their families and farms. Due to poor

water management, they have been suffering from periodic water shortages precipitated by frequent droughts.

Figure 2: The Helmand River, its tributaries, dams and reservoirs



Source: 'The Worst or the Best Treaty? Analysing the equitable and reasonable utilization principle in the legal arrangements of the Helmand River,' Asian Journal of International Law, Cambridge University Press.

The very existence of the Hamun Wetlands is at stake, along with the communities that rely on it for their livelihoods and survival. The Hamuns are a complex of interconnected shallow freshwater inland desert lakes, lagoons and marshes (both permanent and seasonal) that straddle Afghanistan and Iran's Sistan and Baluchestan province. This globally important biosphere boasts 140 species of fish and 150 species of birds and is a stopping point for birds migrating between Russia and the Indian Ocean. The wetlands are one of the only sources of fresh water in a vast region, supporting the production of millions of tons of livestock, fish and agricultural products. According to the most recent reports, the wetlands have gone nearly dry, threatening wildlife and increasing the intensity and length of the seasonal sandstorms on both sides of the border from the usual 120 days to 160

days or more. These sandstorms, which flow eastward and southward (see Earth Observatory), have adverse effects on air quality, visibility and respiratory health of the local population of Sistan and Baluchestan and Nimruz provinces. Nearly 1,000 people were hospitalised in July 2023 due to respiratory ailments in Iran alone (see Anadolu Agency here).

The media have also reported dire consequences on the Afghan side of the border, including in Washir district in Helmand province, where 300 families in one village left their homes in June because of a lack of drinking water, as well as various problems further downstream in Kang district of Nimruz province, on the border with Iran (see these ToloNews and Pajhwok reports). A ToloNews documentary also found that 2,000 families had left Muhammad Abad village in Farah province due to the lowering of the groundwater table and drying of their karez.[4]

THE DISPUTE IN 2023

Since the re-establishment of the Islamic Emirate of Afghanistan (IEA) in August 2021, relations between Afghanistan and Iran have been relatively cordial, even friendly at times. Over the months, there have been regular official visits between the two capitals and several trade deals penned (see for example VoA News and ToloNews). Finally, in February 2023, Iran joined the ranks of a handful of countries to hand over control of Afghanistan's embassy to the Emirate, although stopping short of officially recognising the Emirate.[5] Shortly after Hassan Kazemi-Qomi took up his new post as Iran's Ambassador to Kabul, he gave an interview to ToloNews and outlined the significance of Afghanistan in Iran's foreign policy as the reason for the country maintaining a diplomatic presence in Afghanistan, but hastened to add that official recognition hinged on the establishment of a representative government that "reflected the will of the Afghan people." He stressed that the

[4] A karez is an underground tunnel bored horizontally into the slopes of hills and mountains until it reaches the groundwater table. It then extracts water using gravity pressure and can be used for household and agricultural purposes.

[5] Other countries that have allowed control of Afghan embassies and consulates to be handed over to the Emirate include China, Kazakhstan, Kyrgyzstan, Malaysia, Pakistan, Qatar, Russia, Saudi Arabia, Turkey, Turkmenistan, the United Arab Emirates and Uzbekistan.

two countries were cooperating in a number of areas, including trade and transit, counternarcotics, security and Afghan nationals in Iran. Although he did not reference the water issue in the Tolo interview, Kazemi-Qomi had consistently raised the water issue on previous occasions when he served as Iran's Special Presidential Envoy to Afghanistan (see for example Hasht-e Sobh).

An aerial view of the Helmand River, Helmand province.
Photo: Behrouz Mehri/AFP, 8 November 2011.

Signs of trouble over water started emerging in summer 2022 when Iran formally complained that the Emirate had shut off the flow of water from the Helmand River into Iran.[6] An intense round of negotiations followed, including a 29 July 2022 phone call between Iranian foreign minister Hussein Amir-Abdollahian and his counterpart in Kabul, Mawlawi Amir Khan Muttaqi. During this phone call, Iran's foreign minister "expressed hope for the removal of the artificial obstacles blocking the flow of water" and cautioned that "providing Iran with its water share is an

[6] For an interesting discussion on the souring of relations between Tehran and Kabul, see 'Is the early twilight of the Iran-Taliban honeymoon over?' in The New Arab, 14 June 2023.

important index for assessing the caretaker Afghan government's adherence to its international commitments to Iran" (see Iran's Ministry of Foreign Affairs press statement). Days later, Kazemi-Qomi, who was then Iran's special presidential envoy to Afghanistan, posted a video on Twitter showing water from the Helmand River flowing into Iran (see ToloNews report), implying that the problem had been solved for now. This paved the way for an official visit to Kabul in August 2022 by Iran's energy minister, Ali Akbar Mehrabian, with a delegation of experts to discuss transboundary water issues and expectations of a new water-sharing agreement (more on this later). It was the first time a member of Iran's cabinet had visited Afghanistan since the re-establishment of the IEA (see Iranian news website Pars Today here).

The water issue, however, remained a point of contention. On 9 February 2023, Kazemi-Qomi raised it as a significant concern again in an interview with Iran Press, insisting that only 27 million cubic meters of water, or four per cent of Iran's allocation under the Helmand Treaty, had reached the country in the previous year (see this report in Iran's semi-official news outlet Mehr News and this press statement by the Iranian embassy in Kabul).

Iranian President Ibrahim Raisi further raised the temperature during a visit on 19 May 2023 to Iran's Sistan and Baluchestan province at the border with Afghanistan when he accused the Emirate of unfairly refraining from sending Iran its share, "considering that there is sufficient water stored in Afghanistan" (see Iran's English-language daily Tehran Times here). He issued a stern warning:

> *I want to tell the rulers of Afghanistan not to consider my words as normal, but to take them very seriously; I warn the officials and rulers of Afghanistan to give the rights of the people and the region of Sistan and Baluchistan immediately.*

Afghan pundits downplayed Raisi's statement and speculated that Iran's bellicose assertions about its water rights were intended for "domestic consumption" and were "political theatre" designed to placate the Sunni population in Sistan and Baluchestan province and to show the Iranian population that the government in Tehran was steadfast in safeguarding the country's national interests (see, for example, Rahmatullah Hassan, international relations analyst, speaking on ToloNews' Farakhabar programme, on 20 May 2023, here).

Raisi's speech may also have been intended to win over local communities in Sistan and Baluchestan province, made up largely of Sunni ethnic Baloch who were still reeling from a violent crackdown against protestors,[7] including the

massacre of worshipers at Friday prayers in the provincial capital Zahedan, which had left at least 96 dead and several hundred injured in September 2022 (see this Amnesty International report).

Whatever his intent, Raisi's speech led to a backlash in Afghanistan, with many Afghans saying that no water should be going to Iran (see this Kabul Show video on YouTube). The response included a satirical video, widely distributed on social media, that showed a member of the Taleban filling a yellow jerry can with water from a murky pool to send to the Iranian president (see this al-Arabia Farsi post on X, formerly Twitter).

Emirate officials, for their part, have been largely silent and, when they have spoken, have been pointedly consistent in their messaging, saying merely that they remain committed to giving Iran its water share in accordance with the Helmand Treaty, but stress that there is a significant decline in water flows due to drought conditions (see for example ToloNews quoting the Emirate's acting Foreign Minister here and this ToloNews report). After Raisi's ultimatum, the Emirate's minister for water and energy, Abdul Latif Mansur, cautioned Iran against politicising the water issue and urged it to refrain from making provocative statements, ToloNews reported (see also his interview with ToloNews here). A year earlier, in July 2022, prior to Iran's energy minister, Ali Akbar Mehrabian's August 2022 visit to Kabul, Mansur had called the provisions of the Helmand Treaty "unworkable" and told a press conference in Kabul:

> *Farmers in Nimruz and Helmand provinces do not have enough water to irrigate their lands, some livestock have perished for lack of water and local people do not even have enough water to drink, so Iran using Helmand water is challenging…. This treaty is from the past and it is not possible to implement*

[7] The killing of Mahsa Jina Amini under suspicious circumstances while she was in detention in Tehran, after she was arrested for not observing the hijab by Iran's morality police in September 2022, touched off a public outcry across the country under the banner of 'Woman, Life, Freedom'. The response from Iran's security forces to the protests was violent and brutal: as of January 2023, they had killed 341 protestors nationwide, including 52 children (see Human Rights Watch).

it until after we install modern devices [for measuring river flow] and after that, we can provide water in a precise manner according to Iran's water rights.[8]

Children enter a tent at a temporary camp near Kandahar city for people who have been internally displaced due to drought.
Photo: Javed Tanveer/AFP, 6 January 2022.

Tensions between Iran and Afghanistan escalated on 27 May 2023 – about a week after Raisi gave his ultimatum, when a violent confrontation between Iranian and Afghan security forces broke out at the border between Afghanistan's Nimruz province and Iran's Sistan and Baluchestan province for the second time in a little over a year (see this Al-Jazeera report and this video; see also the interactive map in an Alcis report, 'Holding Water to Ransom'). Initial accounts varied significantly. The Afghan side blamed Iranian forces for firing the first shot and reported that one person had been killed. Ministry of Defence spokesman Enayatullah Khwarizmi said: "The Islamic Emirate of Afghanistan considers dialogue and negotiation to

[8] Mansur was referring to the three delivery gauges proposed by the Helmand Treaty that were to be built on the Afghan-Iranian border to measure the river's flow. Water flow is the volume of water moving past a particular point during a given time period and is generally considered to be a more accurate measure of available water resources in a river basin.

be a reasonable way for any problem [to be resolved]. Making excuses for war and negative actions is not in the interest of any of the parties" (see Al-Jazeera here).

Iran's deputy police chief, Qasem Rezaei, confirmed the incident, but held the Afghan border guards accountable: "Taleban forces from inside Afghanistan, without considering international laws and good neighbourliness, started shooting at the Sasoli checkpoint located at the Zabul border regiment post using various weapons, which were met with a decisive response by [Iran's] brave and gallant border guards." According to Iran's official account, two Iranian border guards and one Afghan border guard were killed in the clashes (see BBC Persian here). While many analysts and media outlets attributed the flare-up of tensions at the border to the water dispute (see for example The Diplomat, CNBC and this Central Asia-Caucasus Institute report), officials in both countries tried to take down the temperature, with both sides ultimately blaming 'enemies' who were trying to fuel tensions between the two countries. "The enemies are seeking to turn the border tension with Afghanistan into a war," said the Commander of the Islamic Revolutionary Guard Corps Aerospace Force (IRGC-AF), Amir Ali Hajizadeh. Similarly, Emirate's spokesperson Zabiullah Mujahid said: "Some circles are trying to destroy the ties between Afghanistan and its neighbours and they exaggerate minor problems. It is the duty of both nations to be informed about such conspiracies. The Islamic Emirate wants good and strong relations with all its neighbours and will not allow such small issues to ruin relations" (see ToloNews here).

Iran even expressed optimism that the issue was a technical one and would be resolved in the near future with Iranian officials being permitted to visit the Dehrawud station (also spelled as Deh Rawud): "There was a problem with the [Dehrawud] water measuring station," which under the terms of the Helmand Treaty is the sole instrument for measuring water flows, Iran's ambassador to Kabul, Hassan Kazemi-Qomi, told the Iranian state broadcaster on 17 June 2023. This, he said, had been "solved and its test steps have been completed, meaning that they [the Afghans] can provide [us with] information. If there is an issue from Iran's side, our experts can go [to Afghanistan] and we are now taking steps [in this regard]." He added that Iranian experts would be visiting the station in the next 15 days (see video here and full transcript of the interview here).

Iranian experts were finally allowed to visit the station, but not the Kajaki reservoir, in August 2023, two months after Kazemi-Qomi's announcement, when they jointly measured the river's flow at Dehrawud with their Afghan counterparts,

representing a significant breakthrough in the stalemate that had prevailed up to that point. According to these measurements, the flow stood at seven cubic meters per second, a 90 per cent decline compared to normal conditions. Iran's energy minister, Ali Akbar Mehrabian, called this decline in available water "unnerving" and asked for proportionally less water share based on the Helmand Treaty (see ToloNews post on X here).[9] Iran also asked for regular monthly inspections of Dehrawud station (see ToloNews here), as per the treaty, which the Emirate seems unlikely to agree to since Iran does not officially recognise the Emirate. As stated by Dr Farouq Azam, an advisor to the Ministry of Energy and Water of Afghanistan, in a statement on his Facebook page, the Emirate believes this non-recognition is flouting the spirit of cooperation that prompted Afghanistan to provide Iran with an additional "goodwill" allocation of water in the Helmand Treaty.

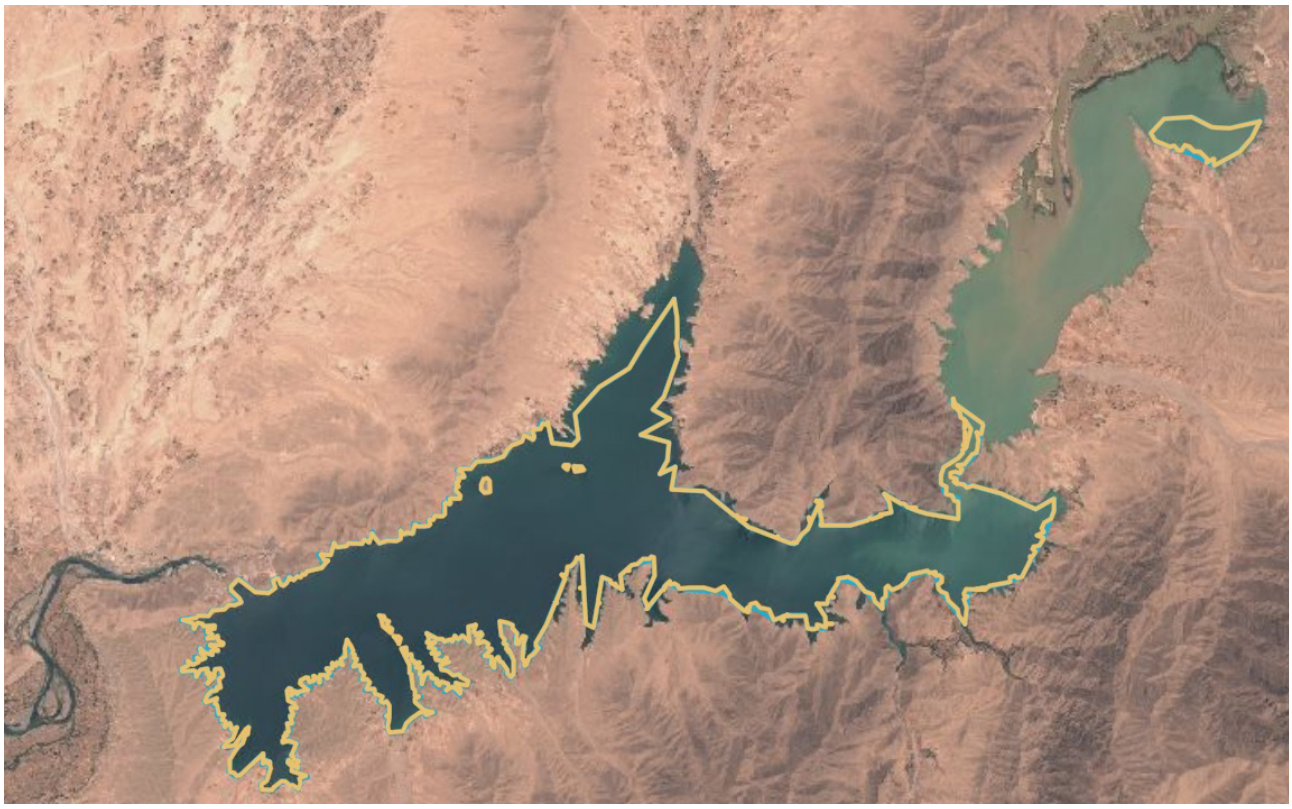
Nevertheless, Raisi's comments in May signalled a change in Iran's approach to the Emirate, reflecting Tehran's growing impatience and a more assertive stance on regional water management, which the country now views as a national security issue (see Iranian news website Hamshahri here). Emboldened by Raisi's comments and frustrated with the lack of headway on the issue, lawmakers in Iran urged the government to stop being "complacent" on the water issue. On 20 June 2023, over 200 members of the Iranian parliament called on the Emirate to release water and comply with President Raisi's demand (see the statement here and Deutsche Welle Farsi report here). They emphasised that failure to release the water could lead to a "humanitarian catastrophe" within three months in Sistan and Baluchestan province.

In a media interview on 16 June 2023, Zahedan MP Fada-Hossein Maleki, who is a member of the parliamentary National Security and Foreign Policy Commission, accused the Emirate of playing a double game with Iran, adding that the Emirate should be forced to give Iran its water share (see Pars Today here. On 23 July 2023, he told the Tehran-based daily Asr-e Iran that the Afghan embassy in Tehran had been handed over to the Taleban in order to secure water from the Helmand River. He said the commission had met foreign minister Amir-Abdollahian to demand Iran use other tools in its toolbox to force the Emirate to the negotiating table, such

[9] As per the Helmand Treaty, measurements at the Dehrawod station are the sole instrument for determining Iran's water share. While water levels at the Kajaki and other reservoirs might indicate that Afghanistan has been storing water rather than sending it onwards to Iran, they do not come to bear on determining Iran's water share.

as "closing the Afghan embassy in Tehran [and] reducing political, commercial and economic connections," including limiting Afghanistan's access to the port of Chabahar in Iran. He also said that Iran's parliament had asked for a probe into Emirate claims that there was not enough water in the Kajaki Dam;[10] according to reports they had received, he said, sufficient water was available in the Kajaki reservoir (see BBC Persian report here).

Figure 3: The Kajaki Reservoir's water surface on 3 June 2023

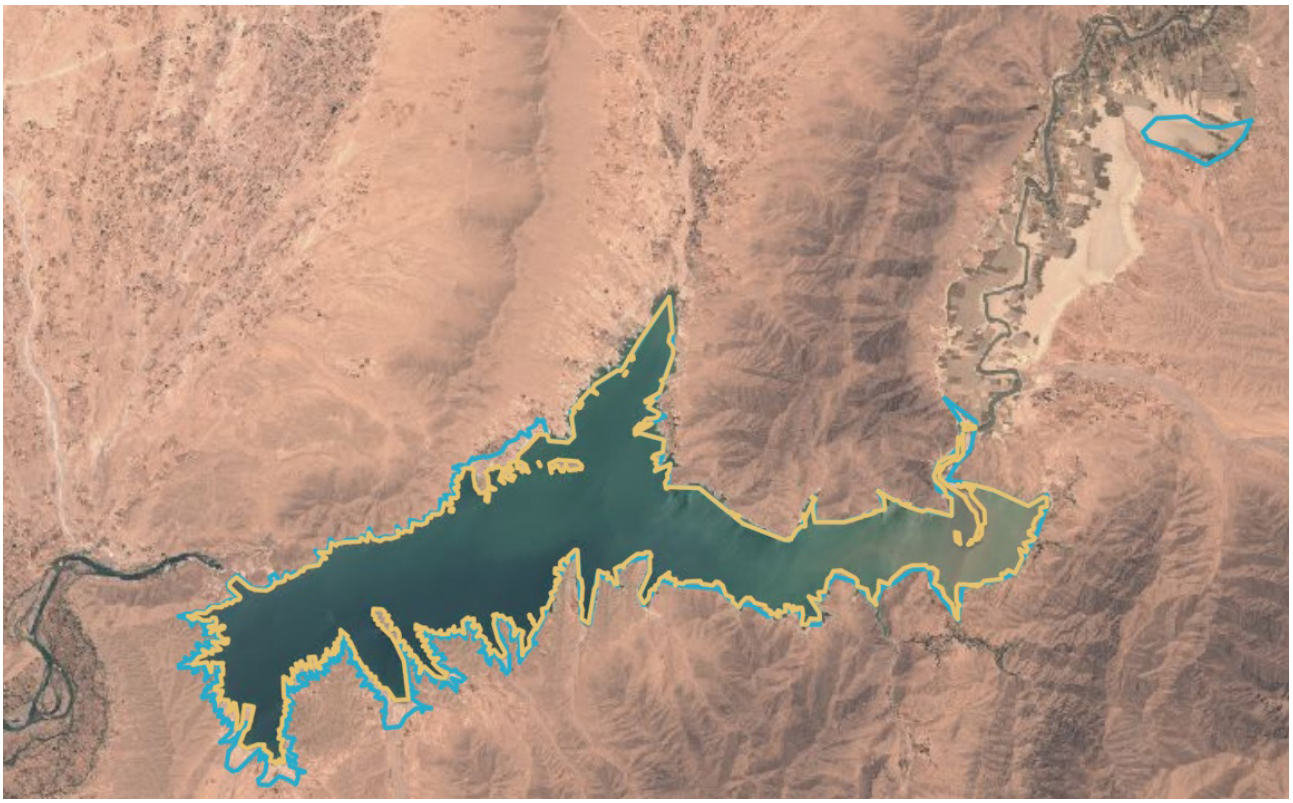


Source: BLUEDOT Water Observatory.

[10] Kajaki is the largest water reservoir in Afghanistan, with a total storage capacity of about 1.5 billion cubic metres. Water is stored in a 100-metre-high, 270-metre-long rockfill dam that was built in 1951-53. The dam was built to regulate water for agriculture and electricity production. According to the US Geological Survey, the storage capacity of this dam has been reduced by 30 per cent due to sedimentation (see here). A new power station with 100 megawatts of capacity was built recently, raising the dam's total electricity production capacity to 150 MW. While the new station was inaugurated on 27 July 2022, electricity production in Kajaki was suspended on 5 October 2022 due to drought. In 2021, electricity production of the old power station (50 MW) was reduced by 85 per cent because of drought and lack of water in the reservoir. The Kajaki Reservoir has played/plays a significant role in Afghanistan-Iran water relations. Iran considers it the main obstacle to water flowing into its territory, while Afghanistan looks at it as one of the most significant pieces of water infrastructure in the country.

Satellite imagery seems to bear out this claim. Pictures from the summer of 2022 and 2023 from the Bluedot Water Observatory, which monitors available water in large reservoirs across the globe every week, show that the Kajaki Reservoir appears to be nearly full (85 and 98 per cent, respectively). The satellite images in Figures 3 and 4 show the water surface in the Kajaki Reservoir on the same day one year apart. The turquoise lines in the figures below represent the water surface average since 2016. It should, however, be noted that the water surface is not directly proportionate to the volume of water in the reservoirs.

Figure 4: The Kajaki Reservoir's water surface on 3 June 2022



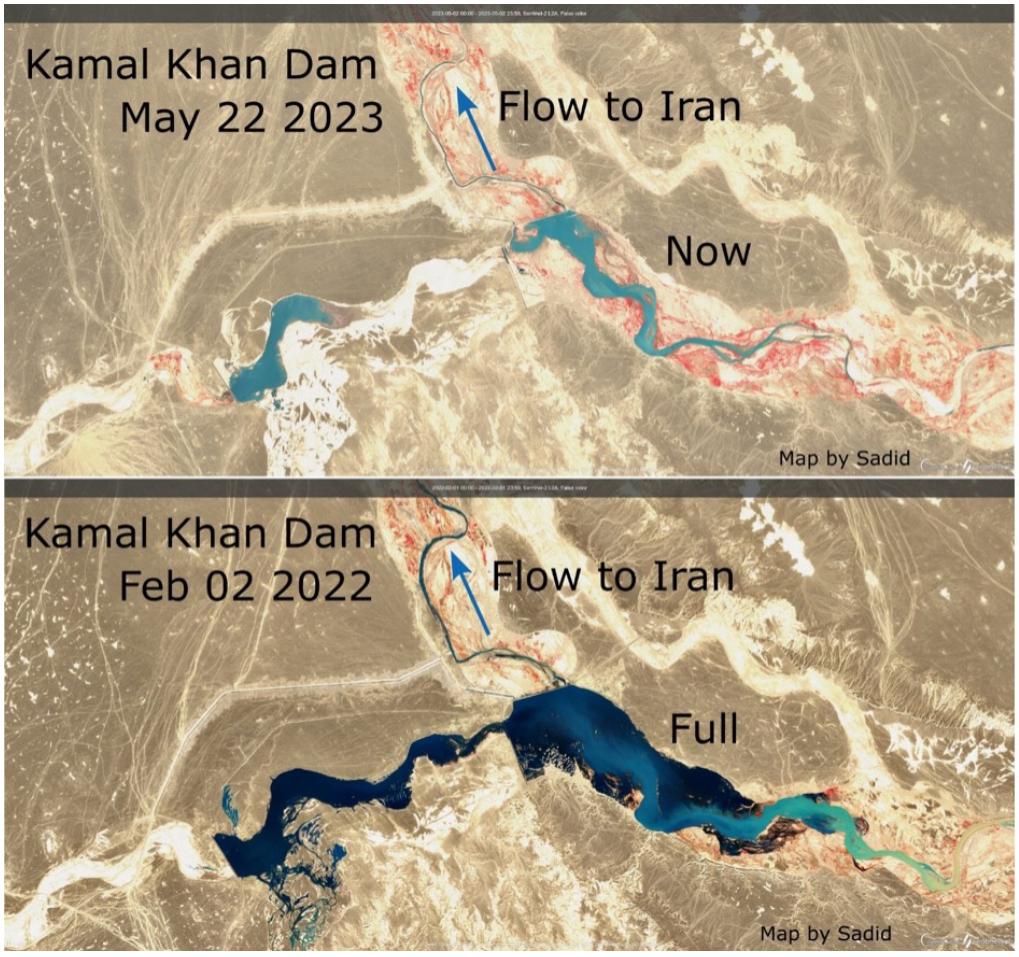
Source: BLUEDOT Water Observatory.

Iranian media, mindful of reports that there was sufficient water in the Kajaki Reservoir, have speculated that the Emirate's unyielding statements on water and its reluctance to send what looks to be available water Iran's way could mean that Kabul is holding Iran's water share 'hostage'. For example, Salamat News has conjectured that Kabul is hoping to use water to gain concessions from Tehran, including official recognition of the Emirate. It concludes: "There is practically no prospect of Hirmand [Helmand] water entering Iran," because the Iranian government has no plans at present to recognise the Emirate.

Afghan water experts, however, dispute these assertions and have presented a different set of satellite images that show two other important reservoirs, the Kamal Khan and Qala-ye Afzal (south of Kamal Khan) Reservoirs as not being full in May 2023, with the water flow lower than the previous February. In a post on X, formerly Twitter, Afghan water resources and environmental expert who is currently a research associate at Germany's Federal Waterways Engineering and Research Institute (BAW), Najibullah Sadid published the images in Figure 5 below and wrote:

> *The Iranian media publishe[d] satellite imageries claiming sufficient water is stored in Afghanistan's Kamal Khan dam & not released to Iran. The below imageries however show Kamal Khan dam almost empty and the outlet gates are open to Iran since Feb 2022.*

Figure 5: Kamal Khan and Qala-ye Afzal Reservoirs in May 2023 and February 2022.



Source: Najibullah Sadid/X, 23 May 2023.

The dispute over how much water is available is partly rooted in the fact that while the Helmand Treaty provided for joint monitoring and measurement, as well as measuring stations at the border, these provisions have never been fully realised. In particular, due to the upheaval in both countries since the signing of the treaty, crucial infrastructure such as measuring stations have never been fully built or activated. Additionally, water demand has increased since 1975, on both sides of the border, including for irrigation. Demand is up and available water resources are down – even before the climate crisis and its forecast of more frequent droughts is taken into account.

While both sides say they agree to follow the Helmand Treaty, they disagree over its interpretation and face practical hindrances over its implementation. The following sections look at the history of the water dispute between Iran and Afghanistan and outline their divergent interpretations of the Helmand Treaty.

THE HISTORY OF DISPUTES OVER THE HELMAND RIVER

Disputes over the Helmand River's water date back to the 19th century, when the boundaries between Iran and Afghanistan were first established by Britain at the end of the Anglo-Persian War.[11] For the past century and a half, claims and counterclaims over rights to the river's waters, intertwined with the recurring spectre of drought, have led to several attempts at resolving this complex matter either through arbitration or by treaty. These attempts, which have each played a role in shaping the present dispute, are briefly discussed below:

1. **Goldsmith arbitration** – In 1872, following prolonged clashes and disputes over the border, Britain tasked the Sistan Arbitration Commission, under the direction of Sir Frederic John Goldsmith (also spelled Goldsmid), with

[11] The Anglo-Persian War touched off when Iran invaded the city of Herat in 1856, prompting Britain, which had long opposed Iran's claims to the city, to declare war. Iran's defeat in the short-lived conflict (November 1856 to March 1857) led to the signing of the Treaty of Paris (1857), which obliged Iran to renounce all claims to Herat and recognise Afghanistan's sovereignty. Under the terms of the treaty, Persia (now Iran) and Afghanistan agreed to refer any dispute between the two nations to Britain for arbitration (see Encyclopaedia Iranica here).

determining the border between Iran and Afghanistan, including each country's rights to the waters of the Helmand River. Goldsmith awarded 'Sistan proper' to Persia and 'outer Sistan' on the right bank of the Helmand to Afghanistan (additional details about this can be found in the Goldsmith award). Article VIII of his decision provided that "no works are to be carried out on either side calculated to interfere with the requisite supply of water for irrigation on the banks of the Helmand." He did not specify what this meant.[12] The fateful inclusion of this article, however, has been one of the main points of contention between Iran and Afghanistan ever since. Some interpretations of this arbitration have taken it to imply the allocation of half of the Helmand River's water as Iran's share.

2. **McMahon arbitration** – Rivers are mutable and have little regard for boundaries drawn by men on paper. Over the ensuing years, the Helmand River created new rivulets to the west and finally burst its banks and changed its course following significant flooding in 1896. This gave rise to renewed disputes over water rights between the two neighbours. After a period of devastating drought at the turn of the 20th century, the water level was so low in the Helmand River that by 1902 the Hamun Wetlands had completely dried up. In 1905, a second British arbitration led by Sir Henry McMahon awarded two-thirds of the water to Afghanistan and one-third to Iran. It also gave Afghanistan the go-ahead to construct a dam upstream (see McMahon award). While Afghanistan was satisfied with the award, it led to widespread protests on the Iranian side of the border. Iran rejected the award and the water dispute between the two countries remained unresolved.

3. **Irano-Afghan Joint Protocol Concerning Distribution of Helmand River Waters** – Over the ensuing three decades, water issues between the two countries were addressed by a joint commission which measured water

[12] This provision was later clarified by the then British Foreign Secretary as per article 7 of the McMahon award in 1905 (see here) which stated:

> *Sir Frederick Goldsmith's award on the water question was as follows: 'It is to be clearly understood that no works are to be carried out on either side calculated to interfere with the requisite supply of irrigation on both banks of the Helmand.' Her Majesty's Secretary of State for Foreign Affairs, in his capacity as the final confirming authority of that award further laid down in 1873, after consulting General Goldsmid, that the above clause should not be understood to apply either to existing canals or to old or disused canals that it may be desired to put in proper repair, nor would it interfere with the excavation of new canals, provided that the requisite supply on both banks is not diminished.*

levels and agreed on Iran's water share during periods of drought. Finally, in 1933, Afghanistan's then King Muhammad Nadir Shah offered Iran a half share of water, as measured at Band-e Kamal Khan (the site of the present-day Kamal Khan Dam) instead of the one-third specified in the McMahon award. These negotiations resulted in a joint protocol and a temporary agreement, provisionally signed by both parties in September 1936, pending parliamentary approval. Iran's parliament ratified the agreement in 1937, but Afghanistan rejected it after its National Assembly objected to a non-interference clause in a declaration annexed to the agreement by Iran. It would have committed Afghanistan not to interfere in the supply of water going to Iran's Sistan and Baluchestan province. While Afghanistan's then foreign minister urged lawmakers to ratify the protocol, they nevertheless rejected it because they viewed the annex as superfluous to the agreement, saying it already contained language to that effect (see this 1947 US Department of State report, which includes a copy of the protocol as Appendix C).

4. **Helmand River Delta Commission** – Against a background of ongoing disputes, a devastating drought in 1946-7 eventually prompted the United States to intervene in 1948. The US proposed the establishment of the Helmand River Delta Commission – comprised of three neutral experts from the US, Canada and Chile – to conduct a comprehensive technical assessment of the entire Helmand basin.[13] In 1951, as a result of their assessment, the commission allocated 640 million cubic metres per year, or 22 cubic metres per second (CUMS), to Iran. Furthermore, the commission greenlighted dams and canals either constructed or planned by Afghanistan (see the Helmand River Delta Commission report). Afghanistan accepted the commission's recommendations. Iran, however, argued that its needs were greater than the commission had provided for.

5. **The Helmand Treaty** – While Afghanistan proceeded with the construction of water infrastructure in the Helmand valley, the issue of water rights remained dormant for another two decades until finally, in 1971, after another devastating drought, the two sides began bilateral negotiations aimed at conclusively resolving the Helmand River water allocations. In 1973,

[13] See 'Interest of the United States in resolving the dispute between Afghanistan and Iran over distribution of the waters of the Helmand River' (1948), here.

nearly 100 years after the Goldsmith award, the two neighbours penned an agreement ending the century-long dispute over the waters of the Helmand River. Iran accepted the Helmand Delta Commission's recommendation after Afghanistan agreed to allocate an additional four CUMS, as a gesture of goodwill that paved the way for the only water treaty between the two countries.

THE LEGAL FRAMEWORK

Water laws in Iran

While Iran's Constitution does not explicitly recognise the human right to water, it does recognise all bodies of water in its territory, including seas, lakes and rivers, to be public property (article 45). In 2016, Iran's then President Hassan Rohani signed the Charter on Citizens' Rights into law, amending it to article 134 of the constitution, which affords Iranians "the right to enjoy a decent life and necessities thereof, such as clean water" (article 2). In addition, the Fair Distribution of Water law spells out the manner in which the state will manage and protect the country's water resources, including which state institution is responsible for controlling and supervising the use of various bodies of water. The right of all Iranian citizens to drinking water is enshrined in articles 149 and 150 of the country's Civil Code, which also allows for members of the public to use "unclaimed water" for drinking.

Water laws in Afghanistan

The fact that Afghanistan's 2004 Constitution does not explicitly recognise the human right to water might be a moot point as the Emirate has invalidated it, although it has not yet introduced a new constitution. Article 9 of the Republic's constitution does, however, task the government with preserving the country's natural resources, including water. Article 2347 of Afghanistan's Civil Code provides: "The water of rivers and their tributaries are considered public property and everybody has the right to irrigate his land from that water or draw a ditch for irrigation purposes except when it is contrary to public interests or special laws." The 2020 Law on the Management of Water Affairs also stresses the public

ownership of Afghanistan's water resources and makes provisions for its use for various purposes, including human consumption, agriculture and energy production. The law prioritises the availability of water for domestic use, including drinking water, which it says should be provided free of charge to citizens, but does allow for water suppliers to charge a fee for delivering water. Article 26 of the law provides that transboundary water allocations should be in accordance with the availability of water in the country.

Drought-affected residents at an International Committee of the Red Cross (ICRC) aid distribution centre in Lashkara, Ghor province.
Photo: Jean-Claude Chapon/AFP, 21 March 2021.

International Law

Several legal instruments exist in international law which place the onus on riparian states (both upstream and downstream) to ensure that the allocation and availability of water is based on various principles: equitable and reasonable use; do no-harm to co-watercourse states; duty to consult and information exchange and; the prioritising of water for human consumption. For example,

the 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses (UNWC) (see also this WWF International explainer about the convention) obliges states to "utilize an international watercourse [in their respective territories] in an equitable and reasonable manner (article 5) and requires them to "take all appropriate measures to prevent the causing of significant harm to other watercourse states (article 7). However, neither Iran nor Afghanistan are signatories to the convention. In this light, the Helmand Treaty remains the only legal instrument governing water sharing between the two states. (For a fuller discussion on international law, regulations and principles relating to water transboundary rights with regard to Afghanistan and Iran, see this article in the Utrecht Law Review).

THE HELMAND TREATY: DETERMINING IRAN'S SHARE OF THE HELMAND RIVER

The treaty that governs water relations between Iran and Afghanistan is officially known as the Afghan-Iranian Helmand River Water Treaty. It was signed on 13 March 1973 by Muhammad Musa Shafiq, the then Prime Minister of Afghanistan, and *Amir-Abbas Hoveyda*, the then Prime Minister of Iran. The treaty establishes Iran's allocated share of the Helmand River and remains in force to this day.[14] In order to avoid potential challenges or disputes that could arise from altering or disregarding the treaty, the two countries agreed that the Helmand Treaty was a permanent agreement that would not be subject to "any other existing or future principle of precedent."

[14] Neither man would live to see the treaty implemented. Shafiq was removed from office four months later, on 17 July 1973 after Prime Minister Daud Khan overthrew King Zahir Shah (his cousin) and seized power to become Afghanistan's first president. Shafiq was jailed for two and a half years and then released, but after the People's Democratic Party of Afghanistan (PDPA) toppled the Daud Khan government in the 1978 Saur Revolution, Shafiq was first imprisoned and then executed, along with several other former officials. According to some accounts, one of the accusations levelled against Shafiq by his executioners was that he had sold Afghanistan's water to Iran (see report on the Taand website here).

Hoveyda was removed as Iran's prime minister and arrested on 7 August 1977, in the final months of Muhammad Reza Shah Pahlavi's reign. After Iran's Islamic Revolution, Hoveyda who, was still in detention when the Shah fled the country, was sentenced to death in a show trial on 7 April 1979 and shot in the back minutes later, as he entered the prison yard.

A cow stranded on a dry Hamun Lake during a sandstorm, Sistan and Baluchestan province, Iran. Photo: Hamed Gholami/Middle East Images via AFP, 15 August 2017.

The Helmand Treaty defines Iran's water share in a normal water year[15] as 820 million cubic metres or 26 CUMS – made up of 22 CUMS as Iran's water share and an additional four CUMS granted by Afghanistan as "an expression of goodwill." However, this figure can be misleading as it seems to suggest that 26 CUMS of water should flow into Iran every second of every day and in all seasons, which is neither correct nor feasible due to seasonal fluctuations in water flows. In fact, Iran's water share is defined in article III of the Helmand Treaty using allocations set forth by the Helmand River Delta Commission (see Table 1 below), which takes into account seasonal variables. It ranges from a maximum of 78.16 CUMS in February (three times higher than the 26 CUMS baseline) to a minimum of 2.32 CUMS in September, approximately ten times lower than the baseline. These

[15] Article 1c of the Helmand Treaty defines a normal water year:

> *[F]rom the first of October to the end of the succeeding September, measured and calculated at the hydrometric station at Dehrawud located on the Helmand River upstream from the entrance to Kajaki Reservoir, is four million five hundred ninety thousand (4,590,000) acre feet [sic] (5661.715) (million cubic metres).*

variations are attributed to prevailing climate conditions and fluctuating flows in the Helmand River and are meant to ensure that both countries receive a fair and proportionate share in accordance with prevailing circumstances.

According to the treaty, the flow data at the Dehrawud station, located upstream of the Kajaki reservoir in Afghanistan's Uruzgan province, would be the sole instrument for determining Iran's water share, which would be adjusted proportionally downwards during periods of drought – in other words, less water in Dehrawud means less water for Iran and/or no water at the Dehrawud station would mean no water allocations for Iran. According to the terms of the treaty, Afghanistan is obliged to make the station's monthly flow data available to Iran upon request and to cooperate with the Iranian commissioner should s/he wish to "observe and measure the flow of water at the Dehrawud station."

Table 1: Iran's water share by month during normal and above-normal conditions

Months	Average share based on 22 CUMS	Average share based on 4 CUMS	Total CUMS
October	4.23	0.77	5
November	10.75	1.97	12.72
December	19.48	3.56	23.04
January	29.35	5.32	34.67
February	66.12	12.04	78.16
March	61.90	11.23	73.12
April	26.30	4.81	31.11
May	7.64	1.39	9.03
June	16.71	3.02	19.73
July	11.61	2.11	13.72
August	7.93	1.44	9.37
September	1.93	0.34	2.32

Source: The Afghan-Iranian Helmand River Water Treaty

Under the treaty, Iran agreed not to claim more water than its share from the Helmand River and Afghanistan retained the right to utilise or manage any excess water as it chooses without fully or partially depriving Iran of its rightful share of the Helmand River's water. Afghanistan also agreed not to take any action that would make the water delivered to Iran "totally unsuitable for agriculture or to cause it to be polluted by industrial chemical effluence to such an extent that even

being purified by conventional modern technical methods, still its use remains to be impossible and harmful for domestic purposes."

Thousands of fish, which locals subsist on, perished when Hamun Lake dried up due to drought in 2016, Sistan and Baluchestan province, Iran.
Photo: Hamed Gholami/Middle East Images via AFP, 28 May 2016.

The treaty provides for Iran's water share to be delivered at three designated points (see article III) – one where the boundary lines intersect Rud-e Sistan and two others located between pillars 50 and 52 at the border. The two countries committed to determining the precise locations of these points within three months of the treaty's enforcement. They also agreed to ensure the effective and accurate delivery of Iran's water share by building appropriate joint water measuring structures on the border and installing necessary equipment, but technical details and particulars were not expanded upon and were presumably left to be agreed by technical working groups. Neither the delivery points nor the measuring structures were ever built as a result of the volatile political times in both Afghanistan and Iran (more on this later). In addition, the Dehrawud station which was reportedly reactivated in March 2023, has, for the most part, been inactive because of the ongoing conflict in the area and was, at any rate,

inaccessible during periods when the area was under the control of opponents of successive Afghan governments.[16]

The lack of delivery stations and measurement devices on the border and the sporadic availability of data from the Dehrawud station mean there is currently no established procedure for joint inspections or data sharing to exchange and synchronise recorded data. As things stand, each country measures water flows in their respective territories independently, leading to an absence of concurrence between the two neighbours about how much water is available and how much is actually delivered to Iran. Generally, Afghanistan's flow records indicate a higher volume of water being delivered, while Iran's records suggest a lower amount of water being received, fuelling distrust between the two neighbours about the veracity of each other's claims and their sincerity in honestly implementing the Helmand Treaty.

The treaty also envisions a structured, sequential and timely process to resolve disputes in a fair and equitable manner – initially, through bilateral discussions between "water commissioners," who are high-level officials (called the Helmand River Commissioners) appointed by both parties, using data obtained from the Dehrawud station. The treaty provides further resolution mechanisms should these technical-level bilateral discussions prove unfruitful – first through diplomatic negotiations, then by seeking "the good offices" of a mutually agreed upon third party and finally, if disputes remain unresolved, by an independent arbitrator, who should objectively evaluate the arguments and evidence presented by both parties and issue a binding decision to settle the dispute. If the parties fail to agree on an arbitrator, the Secretary-General of the United Nations could be requested by either party to appoint an arbitrator, who must not have common interests with either Afghanistan or Iran.

The treaty, however, was never fully implemented. A palace coup in 1973 by former prime minister Muhammad Daud Khan overthrew Afghanistan's king Muhammad Zahir Shah and ended Shafiq's premiership. In the five years of relative stability that followed the treaty was ratified, but the delivery and measurement structures to ensure its implementation were never completed. Five years later, the Saur Revolution of April 1978 triggered decades of wars in Afghanistan, halting planned

[16] According to a January 2023 article in The Diplomat, Afghanistan has "reactivated the Dehrawood [Dehrawud] Hydrometric Station in March 2023, which was destroyed in 2021."

development projects in the Helmand River basin, including the construction of the Kamal Khan and Bakhshabad dams.

At the same time, the Islamic revolution in Iran in February 1979 and the eight-year war with Iraq (1980-88) shifted Tehran's focus and resources to more pressing issues at home. This hampered the implementation of the Helmand Treaty and tensions over water rights simmered in the background. As subsequent Afghan governments were weakened by civil war and instability, the absence of proper water management mechanisms meant that water flowed into Iran unhindered. In periods of drought, however, the water issue would come to the foreground, leading to occasional flare-ups between the two neighbours.

IRAN AND AFGHANISTAN'S ATTEMPTS TO SECURE ADDITIONAL WATER

Over the past few decades, Iran's water needs have steadily increased. The end of the Iran-Iraq war in 1988 ushered in a period of relative stability in Iran which allowed for the development of irrigation and infrastructure in Sistan and Baluchestan province. This included expanding arable lands, diverting water from the Hamun Wetlands and other sources to the Chah Nima reservoirs for irrigation, transferring the waters of the Hamun to Zahedan and undertaking multiple minor projects (for more detail watch Iranian environmentalist Mohammad Darvish's interview with Iran's state broadcaster IRIB). In Afghanistan during the same period, there was no such stability and attempts at developing the country's water management infrastructure hobbled along, hampered by the fact that much of the area in the Helmand River basin was often not under government control.

During the rule of the Islamic Republic of Afghanistan, relations between Afghanistan and Iran fluctuated between cooperation and confrontation – from then President Hamid Karzai referring to Iran as a "helper to Afghanistan" in a 2007 CNN interview to accusations levelled against Tehran that it was arming the insurgency (see this New York Times report and this Jamestown Foundation report). In the final years of the Ashraf Ghani administration, Iran extended invitations (see reporting by Iran's Islamic Revolutionary Guard Corps (IRGC) affiliated Tasnim

News) to and provided support for the Taleban, including hosting several Taleban delegations (see Radio Free Europe/Radio Liberty (RFERL) report). Some officials of the Republic interpreted this move as Iran fuelling the flames of war in an attempt to halt ongoing water management projects in western Afghanistan that would check unhindered water flow into Iran (see BBC Persian here).

Tensions reached a feverish pitch in the lead-up to the inauguration of the Kamal Khan Dam construction in 2021. Iran reasserted its position that the dam would deprive it of its full share of water under the Helmand Treaty and wreak havoc on the Hamun Wetlands, causing the drying up of this internationally protected ecosystem (see the designation on the Ramsar Convention[17] website and UNESCO's designation of the Hamoun Biosphere Reserve here), wildlife to be threatened, agriculture activity disrupted local communities harmed and the sandstorms that plague the region to increase (see this USIP report). For Afghanistan, however, the successful completion of the Kamal Khan Dam represented the culmination of decades-long plans to build a dam on the site of an ancient, millennium-old water reservoir,[18] which would transform Afghanistan's economy, providing electricity and water for agriculture and drinking, and prevent floods.

After the Taleban regained power, they resumed the construction of several water management projects, including the Kamal Khan and Bakhshabad dams. It comes as no surprise that the Emirate would adopt the water management strategy of the regime it had overthrown. The preliminary work for these projects, including their design, had already been completed and for the Emirate keen to show that it was delivering on basic services, they represented low-hanging fruit that could be finished quickly and with a relatively small budget. Many other water infrastructure projects in Afghanistan's eastern and northern regions lack detailed blueprints and thus remain far from implementation.

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[17] The 1971 Ramsar Convention on Wetlands of International Importance (also known as the Convention on Wetlands) is an international treaty designed "to develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life (see the text of the Convention here and the List of Wetlands of International Importance, also known as the Ramsar List here).

[18] Band-e Kamal Khan was first built in the 11th century from baked bricks and ancient lime mortar. It supplied water for hundreds of years through a complex canal system. Tamerlane destroyed the dam at the end of the 13th century in order to punish the region's mostly Baloch inhabitants. Since then, the region has turned into a desert. The dam was forgotten until the early 1970s, when then President Muhammad Daud Khan listed it in his five-year master plan for Nimruz (for further information, see 'Transboundary Water Resources in Afghanistan' by John Shroder and Sher Jan Ahmadzai).

The Emirate's plans to proceed with the third phase of the Kamal Khan Dam and the second phase of the Kajaki Dam will certainly limit Iran's access to the water resources of the Helmand River, unless the Emirate uses the water to generate electricity which would allow for more water to flow downstream into Iran. The Helmand Treaty gives Afghanistan the right to proceed with constructing these additional phases, provided it can show that they do not hinder Iran's ability to receive its share of the Helmand water as defined by the Treaty.

CLAIMS, COUNTERCLAIMS AND DIVERGENT INTERPRETATIONS OF THE TREATY

One of the key challenges for managing the water of the Helmand River is that Afghanistan and Iran have divergent interpretations of the Helmand Treaty, which have contributed to their disagreements and have so far not been solved through negotiation or arbitration. These interpretations have been echoed on both sides by politicians, officials and even some experts and scientists, thereby limiting the prospects for neutral dialogue. The following section examines the main claims and justifications put forth by Afghanistan and Iran.

Iran claims that its existing water share of 26 CUMS does not cover all the water it is entitled to. In particular, it claims that the allocated amount is solely meant for domestic and agricultural use and does not include the Hamuns' share, which it says is "nature's share" and vital to the preservation of the wetland and its biodiversity (see Mehr News here). Conversely, Afghanistan argues that the Helmand Treaty encompasses all aspects, including the environment and it is not obliged to provide additional water to Iran from the Helmand River for the Hamuns (see Hamshahri here).

A closer look at the treaty's monthly allocation schedule shows that the highest volume of water, which is allocated in winter (December to March) and coincides with the lowest agricultural demand, is about 530 million cubic metres, or 66 per cent of the water allocated each year to Iran (according to the author's calculations based on the provisions of the treaty). In a normal water year, this would appear to be sufficient to replenish the Hamun Wetlands, preserving their water levels and

supporting biodiversity. However, Iran diverts the water coming into its territory during these winter months to the four Chah Nima reservoirs, with a total volume of 1,460 million cubic metres (640 m in Chah Nima 1, 2 and 3 as potable water and 820 m in Chah Nima 4 for agricultural and environmental purposes) for use in Sistan and Baluchestan province (see Tasnim News here). A portion of this water (26 million cubic metres per year) is being transferred to Zahedan through a pipeline, according to a report by the Iranian firm Dyke Consulting Engineers. An Afghan official, speaking to the author under condition of anonymity, pointed to this as an indication that Iran was diverting water allocated to the Hamun Wetlands, or "nature's share" under the Helmand Treaty and was, thus, significantly contributing to the wetland's decline.

Iran also claims a water share from the Farah-Rud, Khash-Rud and Harut-Rud, small rivers draining from Farah, Nimruz and Ghor provinces. These small rivers, located entirely in Afghanistan, are seasonal water sources for the Hamun Wetlands on Afghanistan's side of the border and do not drain into Iran's territory. Afghanistan claims that these rivers had been considered by the Helmand Delta Commission in its technical report and were taken into account when Iran's water share was determined in the Helmand Treaty. Similarly, there are small rivers in Iranian territory, such as Hussainabad and Nahbandan, that would ordinarily contribute to the water flow into the Hamun Wetlands, but their waters are being utilised for domestic and agricultural purposes.

There are also complaints about the use of groundwater, ie water held underground in the soil or in pores and crevices in the rock. In the lowest areas of an endorheic basin – a closed inland water system that does not drain into the ocean, such as the Helmand River basin – groundwater seeps out of the ground and forms another source for the Hamun Wetlands.

Indeed, it used to be the primary source of water for the Hamun Delta, but the water table has been in terminal decline due to over-extraction in both Afghanistan and Iran, with each side blaming the other for the loss. Iran blames unchecked groundwater extraction by individuals, which has been intensified by the use of solar panels to extract water from deep wells for irrigation on the Afghan side of the border. At the same time, Afghanistan points to agricultural subsidies provided by the Iranian government to farmers who use groundwater for irrigation (see 'The Emerging Dynamics for Conflict and Cooperation Between Iran and the Taliban

Over the Helmand River' published on the Water, Peace and Security (WPS) website and Iranian news website Salamat News here).

Afghanistan has denounced Iran for installing water pumps near the Helmand riverbed, according to the WPS, resulting in increased water seepage and hindering surface water delivery through the riverbed. Afghanistan argues that Iran's failure to remove these water pumps is one of the main reasons that work on the construction of the three delivery gauge structures and the full implementation of the Helmand Treaty has stalled. These issues have been discussed by the Helmand River Commissioners, who have met at least 25 times in the past 20 years, according to Ikramuddin Kamil, writing for The Diplomat:

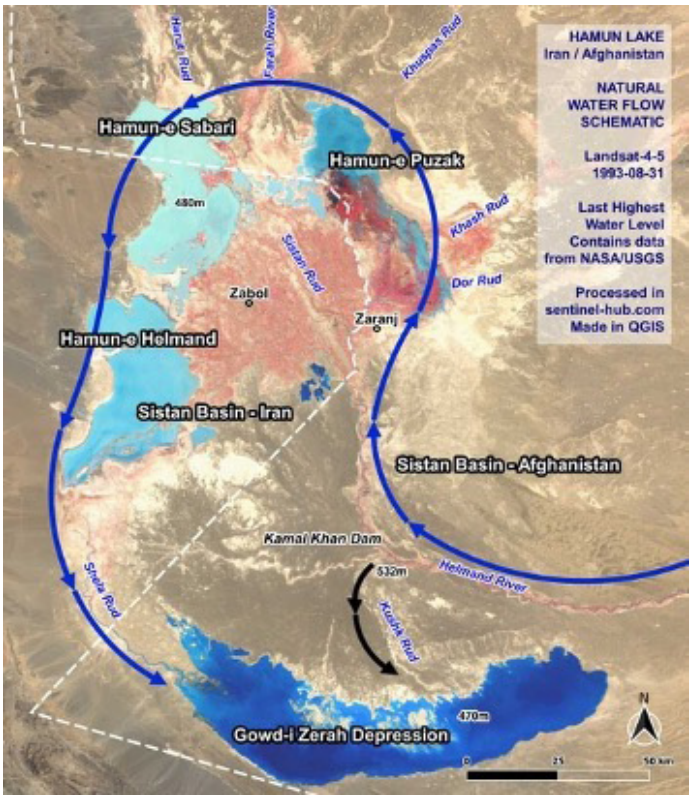
> *An agreement was reached to build joint hydrometric stations in the 21st meeting of the Joint Committee of Commissioners of Helmand River [in 2019]. However, it remains on paper only. Similarly, in August 2022, Afghanistan and Iran again agreed to a timeline for the construction of joint hydrometric stations. But experience shows that such a project will take years to complete.*

Iran also asserts that floodwaters are not covered by the Helmand Treaty and should not be counted against their allocations, pointing to the fact that they have not been counted for the past half-century (see Hamshahri here). In interviews with the author, Afghan officials, on the other hand, argued that floods are inherently part of river flow and considered as high-flow or above-normal flow in both the Helmand Delta Commission's technical report and the treaty. They further argued that although Afghanistan has been unable to fully implement the Helmand Treaty since it was signed half a century ago, this does not mean that Iran has rights to floodwaters over and above its allocations as per the treaty.

Another point of divergence between Afghanistan and Iran concerns the flow of water to God-e Zerah in Nimruz province, which is part of the Hamun Wetlands on the Afghan side of the border.[19] While Iran has registered the three wetlands on its territory as the Hamoun Biosphere Reserve under the Ramsar Convention (Hamun-e Pozak, Hamun-e Sabari and Hamun-e Helmand), Afghanistan is not a signatory to this treaty and has, therefore, not registered any of its wetlands in the Helmand River basin as internationally protected waters under the Ramsar Convention. (See Figure 6 for the location of the four interconnected wetlands).

[19] There are two other wetlands in the Helmand River basin – Dasht-e Nawar and Abe-Istada – both in Ghazni province of Afghanistan.

Figure 6: The Hamun Wetlands and the usual natural water flow of its waters



Source: SOAR website.

The wetlands that are located in Iran and on the border receive water directly from the Helmand, Khash-Rud and Farah-Rud rivers. However, God-e Zerah, on the Afghan side of the border, receives water from the Hamun-e Helmand (in Iran) through a natural connecting gulley. God-e Zereh, the lowest section of the lake, is 467 metres above sea level and 10 metres lower than the rest of the Hamuns and receives water only when the runoff from the main tributaries is extremely high. However, because groundwaters in the Hamuns are interconnected, water seeps into God-e Zerah when the groundwater table rises.

In recent years, drought conditions and the lack of water flowing into this wetland have caused God-e Zerah to dry up. As a result, some Iranian officials refer to this wetland as an inland salt marsh (see Tasnim News here), which evaporates water into the atmosphere and no longer has the status of a wetland. Afghanistan, on the other hand, considers God-e Zerah an inseparable part of the Hamun Wetlands and holds that the evaporation rate there is the same as elsewhere in the Sistan region, including the Hamuns in Iran. It asserts that water flowing into God-e Zerah will help restore its water levels and biodiversity and, for this reason, has built a spillway to channel excess water from the Kamal Khan Dam to God-e Zerah.

Iran had long objected to the construction of the Kamal Khan Dam, itself, arguing that it would interfere with the delivery of its water share from the Helmand River. After the dam's inauguration in 2021, Tehran raised the alarm that Afghanistan had changed the course of the Helmand River by constructing an 'artificial canal' to deliver water from the dam to God-e Zerah Wetland (Figure 6), thus hindering the overall Helmand River flow to Iran (see Sistan and Baluchestan province based Khabar-e Hamun here and this Mohammad Darvish interview). It accused

Afghanistan of diverting the Helmand River to such an extent that, even if water did flow from the dam, it would no longer go to Iran. Afghanistan maintains that the dam will regulate the water and help deliver it to Iran according to the schedule in the Helmand Treaty.

A young boy sits beside empty water buckets, Sistan and Baluchestan province, Iran.
Photo: Oshida/Middle East Images via AFP, 19 January 2021.

Nazim Samoon, former legal advisor to the Ministry of Energy and Water of Afghanistan, stressed to the author that the Kamal Khan Dam has gates that release water into the river's natural course, which can be used to deliver Iran's water share, as well as irrigate Afghan farms in Nimruz. He acknowledged that the spillway, a relatively low part of the dam that spills excess water downstream for the dam's safety, does conduct any excess water to the Qala-ye Afzal Dam further south and subsequently to the God-e Zerah wetland. This, he says, is one of the river's historic flow paths, called Khoshk-Rud, meaning dry river (see Figure 6) and is not an artificial canal. He further claims that since 2022, no water has been diverted to God-e Zerah and that diverting excess water from a reservoir to the nearest wetland, only once, does not constitute a change of the river's natural course.

Iran's final, and possibly main, complaint is that the treaty does not sufficiently take into account the consequences of climate change, including raised temperatures and the increased frequency of droughts, particularly in the Helmand River basin. These factors contribute to greater water loss through higher evapotranspiration,[20] reducing the availability of water for human consumption and agriculture. Iran wants a bilateral commission to re-evaluate the basin and propose a new water allocation schedule. Afghanistan asserts that article IV of the Helmand Treaty provides for adjusting Iran's share during a drought year and can be used in any year affected by climate change.

Afghanistan also contends that climate change is a global phenomenon that affects both countries and that any additional damages caused by it should be addressed through global climate change funds. This, however, is complicated by the fact that both Iran and Afghanistan are subject to sweeping international sanctions.[21] Without sanctions relief, the availability of substantive international funds to help either Iran or Afghanistan combat the effects of climate change seems unlikely. Most of all, Afghanistan rejects any re-evaluation of the basin, citing that the treaty is permanent and not subject to any other present or future precedents as per article X.

There are indications that Iran is hoping to renegotiate the Helmand Treaty rather than seek to solve the differences in interpretation and thereby improve its implementation. This idea certainly had currency in 2004, when Iranian lawmakers issued a report urging the government to renegotiate the Helmand Treaty in light of climate change and offer financial and other incentives to Afghanistan in

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[20] Evapotranspiration is the combination of evaporation, which is the movement of water into the air from the soil and bodies of water bodies, and transpiration, which is the movement of water into the air from the root systems of plants.

[21] The government of the Islamic Republic of Iran and certain named Iranian individuals, companies and organisations are subject to sanctions by the United States (see here) and the European Union (see here) for their involvement in the country's nuclear and ballistic missile development programme, supporting terrorism and human rights abuses. All United Nations Security Council (UNSC) sanctions on Iran were lifted on 20 July 2015 (see UN Resolution 2231), when Iran signed the Joint Comprehensive Plan of Action (JCPOA) contingent on Iran complying with its commitments under the nuclear deal.

After the Taleban swept into power in August 2021, various international sanctions which had targeted the Taleban and its individual members came into play for the Emirate and the country as a whole, most notably the sanctions imposed by the United States and the United Nations (Security Council Resolution 1988 and Executive Order 13224); see this Just Security report for more information on Afghanistan's sanctions regime.

exchange for water (see the parliamentary report). A source in the previous Afghan government who was involved in discussions related to water between Iran and Afghanistan – and asked for anonymity – gave his interpretation of Iran's reluctance to ask for the good offices of the UN, as is its right, under the Helmand Treaty. He thought the reluctance was driven by Tehran's hopes that its grandstanding over the water issue would undermine the value of the Treaty as unfeasible and ineffectual and create an environment conducive to renegotiation. In 2022, the Iranian presidential envoy to Afghanistan said he was trying to reach a new agreement with the Emirate regarding water distribution (see Radio Azadi here). However, Afghan water experts have pointed out that the Emirate has yet to achieve international recognition from any country, including Iran, which weakens the Emirate's position in any negotiations on the water issue (see Hasht-e Sobh here).

POSSIBLE ALTERNATIVES TO CONTROLLING AND SHARING THE WATER OF THE HELMAND RIVER

Over the years, Iran has been exploring other options to meet its demand for water, including the purification and desalination of seawater and wastewater treatment (see Iran's Islamic Republic News Agency (IRNA) here). However, the costs associated with such methods have proven to be very high. In more recent years, Iran has attempted to fulfil Sistan and Baluchestan's water demand by digging deep wells to reach the deep groundwater (up to 3,000 m below the earth's surface). Three deep wells were reported to be artesian,[22] capable of producing a significant volume of water out of the ground under natural pressure. However, the water quality from these wells has lately proven unsuitable for domestic use due to the existence of eight heavy elements. The suitability of this water for agricultural purposes remains unreported.

The idea of Iran purchasing additional water from Afghanistan dates back to the signing of the Helmand Treaty, but at the time the idea faced criticism in Afghanistan by government officials who leaned on nationalist sentiments to argue that Iran was trying to "bully Afghanistan into selling its water"(see this

[22] An artesian well brings groundwater to the surface without pumping by using the pressure within an aquifer.

account of the discussions concerning the treaty on the Sweden-based Farda Historical Club website). The idea was raised again nearly half a century later, in 2017, during then President Ghani's visit to Iran when then Iranian President Hassan Rohani expressed Iran's interest in purchasing or trading oil for water from Afghanistan and again by Ghani when he inaugurated the Kamal Khan Dam's construction in March 2021 (see BBC Persian here). In his speech, Ghani said that water exceeding Iran's allocated share would no longer be provided for free, but could be exchanged for fuel (see BBC Persian here). The sale of water to Iran or its exchange for fuel or other goods could serve as a temporary solution. However, Afghanistan's water demand is expected to rise significantly once more land comes under cultivation in the Kamal Khan basin, requiring more water for irrigation. As a result, Afghanistan may face greater challenges in providing water to Iran, even in exchange for oil or money, particularly during drought periods.

A boy runs for cover during a sandstorm in an unidentified village near Hamun Lake, Sistan Baluchestan province, Iran.
Photo: Oshida/Middle East Images via AFP, 21 August 2022.

Financial cooperation with Afghanistan is another option that experts recommend Iran could utilise (see this BBC Persian interview with the Director of the United Nations University Institute for Water, Environment and Health (UNU-INWEH),

Kaveh Madani). One such choice is swapping electricity for water from Afghanistan, beyond Iran's agreed share. Iran could reduce the cost of electricity it currently exports or provide it for free to residents of Nimruz and Herat provinces. The possible expansion of Afghanistan's electricity grid in the southern region would mean that Afghanistan would have to produce more electricity to meet its domestic needs. This would require more water being released from Kajaki to meet the demands of hydropower stations downstream. Iran could support the expansion of Afghanistan's electricity grid and power generation infrastructure with technical, material and financial assistance, paving the way for higher electricity generation in Kajaki and, accordingly, an increased amount of water flowing into Iran during the summer months.

FINDING A WAY FORWARD

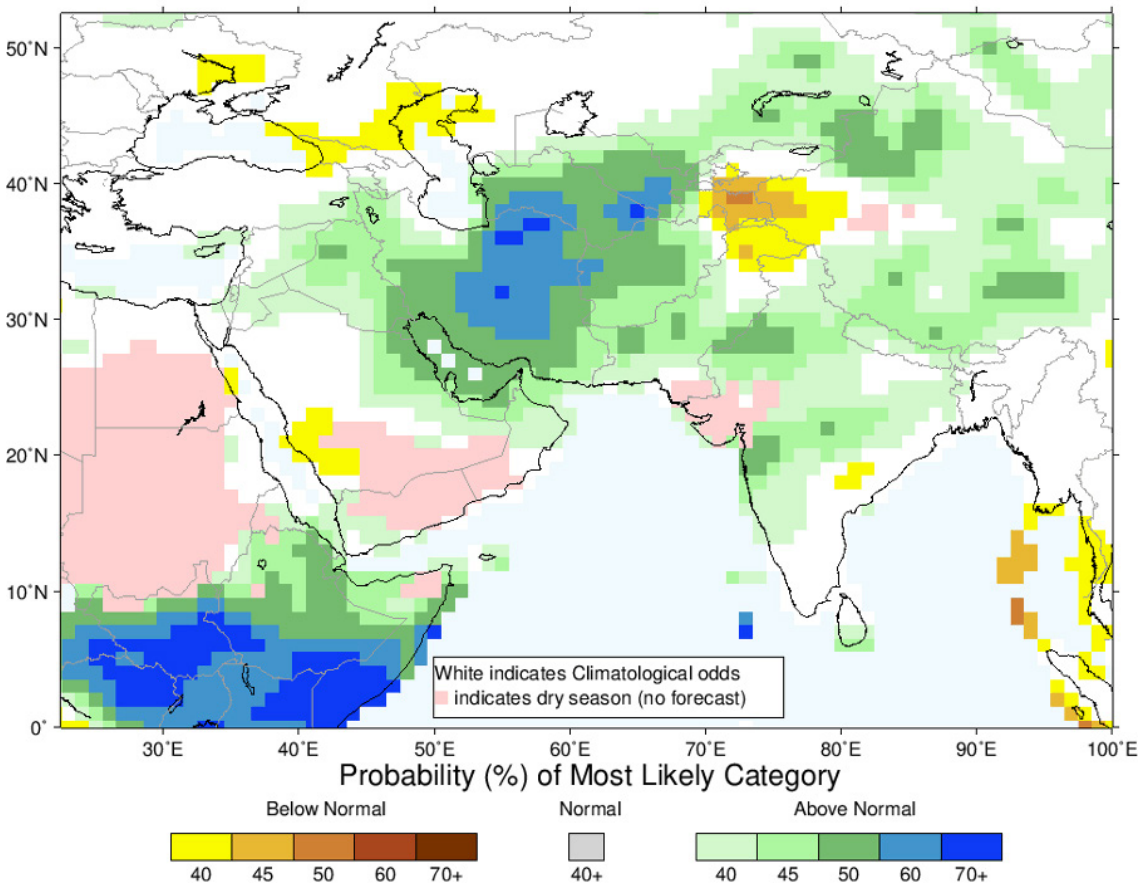
Looking at options for resolving the deadlock, the Iranian government could possibly seek the good offices of the United Nations based on the mechanism proposed by the Helmand Treaty, as it did in 2001. However, even if UN arbitration found in favour of Iran, it is unlikely that it could compel Kabul to comply with the decision given that the Emirate does not currently hold Afghanistan's seat at the United Nations. Kabul must also be aware that Iran, cognisant of these constraints to a favourable outcome, is likely to refrain from pursuing arbitration.

Iran could make good on its threats to exert pressure on the Emirate through other means, including expelling Afghan migrants and restricting trade with the Emirate (see for example Radio Farda here and the state-owned Fars News here). Such tactics, however, seem unlikely to prompt the IEA to send more water Iran's way. The current volatile political situation in Iran's Sistan and Baluchestan province also means that Iran will likely continue its rhetoric about securing water for the people of Sistan and Baluchestan in an attempt to placate public opinion there. In this light, Iran is unlikely to take steps that would escalate tensions either between Tehran and Kabul or domestically in Sistan and Baluchestan province.

With the start of the wet season and predictions that precipitation will be above normal this year, it seems most likely that water will recede from the bilateral political agenda for the time being. However, it will remain a lingering issue,

simmering in the background and flaring up again during periods of drought. The growing climate crisis will only intensify the long-term competition for water.

Figure 7: Seasonal precipitation forecast for November 2023 to January 2024



Source: International Research Institute for Climate and Society, The Columbia Climate School, Columbia University website, October 2023.

The wet season, which began this month, is predicted to bring above-average rainfall for both Afghanistan and Iran in October-December 2023 and winter 2024 (see Figure 7 for the seasonal weather forecast). That should improve water availability in the Helmand River basin and allow water to flow from Kajaki to Iran. Although the Kajaki Reservoir has not yet overflown into its spillway, the water level is already a little higher than it was in 2022. For now, both sides seem to be erring on the side of caution and attempting to de-escalate tensions.

The year 2024 is also predicted to be above-normal wet and associated with floods in Iran and Afghanistan, similar to 2019, owing to the El Nino event in the Pacific Ocean. The year after an El Nino event is usually a normal water year. Therefore, tensions between Afghanistan and Iran over water will likely be minimal during

the next two years. However, following a normal water year, as expected for 2025, drought may be triggered in 2026 or a year later.

The arrival of rain this autumn should help defuse the recent dispute – for now. Ideally, it would give the two neighbours time to negotiate and find a way out of the stalemate that has been the status quo for decades. However, given that climate change will reduce available water and needs continue to increase, change must also come on the demand side. Without practical steps to manage the demand for water in Iran and Afghanistan, there is no hope that this long-running dispute will go away. However, those practical steps do exist.

A man fishes in the Helmand River just before sunset in Lashkar Gah, Helmand province
Photo: John D McHugh/AFP, 23 May 2006.

Bearing in mind that the climate crisis is predicted to see the region cycle through periods of prolonged drought punctuated by periods of rain, using advance warning systems, such as Columbia University Seasonal Climate Forecasts, would allow both countries to better prepare for periods of drought and resolve water allocations before they escalate into disputes. The commissioners from both countries could make use of these systems to determine Iran's water share, ahead of time, and develop an implementation plan accordingly.

Modern technologies also present interesting alternatives to constructing the three delivery stations on the border, such as eco-friendly fluid tracers that could be used jointly to measure Iran's water share. These chemicals measure irregular cross-sections, ie, unlike traditional methods, they can quantify water flow in turbulent conditions (a video guide to utilising this accepted measurement technique using various chemicals is available here).

Thousands of men perform a special prayer for rain in drought-ridden Kandahar city.
Photo: Murteza Khaliqi/Anadolu Agency via AFP, 25 December 2021.

For there to be progress, agriculture also needs to change, not just how crops are irrigated, but what crops are grown. Crop diversification to plants or varieties of plants that require less water, adopting water-saving technologies for irrigation, and upgrading the irrigation infrastructure would reduce water consumption in both countries. Limiting the use of solar-powered water pumps that allow water to be brought up from deep wells would help replenish groundwater. That, in turn, would contribute to the revival of the Hamun Wetlands. Re-greening the

Hamun Wetlands by planting drought-tolerant vegetation and trees to combat desertification could help revitalise them and potentially reduce the occurrence of sandstorms in the region. Afghanistan and Iran could follow the example of their Central Asian neighbour, Uzbekistan, which is implementing a re-greening programme to reverse the devastating impact of the Aral Sea's desertification and revive the sea's basin (see this Euronews here and the statement of Uzbekistan's President Shavkat Mirziyoyev at the 78th session of the UN General Assembly here). Successful implementation of these strategies, however, requires significant funding. Climate change global funds could be made available if sanctions on Afghanistan and Iran were lifted or exemptions made to allow for the allocation of these funds.

These steps hold the potential to alter the current trajectory and help the two countries find long-term solutions to safeguard their domestic water needs, protect the natural environment and restore biodiversity to the Hamun Wetlands within the confines of increasing demands and diminishing water resources.

Two years of good rains, if they come as predicted, would give both nations the chance to re-evaluate how they share water under less pressurised conditions. However, while the path forward will require technical know-how, more fundamental will be the political will to find mutually acceptable solutions.

In the end, the future of water relations between Afghanistan and Iran hinges on constructive dialogue and shared responsibility. Only by working together and embracing innovative approaches is there hope for a more stable and sustainable water future for both nations.

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Cover photo: Kajaki Dam in Helmand province.
Photo: Wakil Kohsar/AFP), 21 March 2021.