Analytical **BRIEF**

USAID Economic Analysis and Data Services (EADS)

August 2016

WATER ALONG THE NEW SILK ROAD

Water in South and Central Asia has historically been a contentious issue and one that has been exacerbated since the fall of the Soviet Union. During the Soviet era, natural resources in most of Central Asia were centrally managed by Moscow, preventing conflict between the Soviet Republics. Under this plan, the Kyrgyz Republic and Tajikistan both relatively abundant in water resources—provided water to Kazakhstan, Turkmenistan, and Uzbekistan in the summer in exchange for coal, gas, and electricity to supply heat during cold winter months.¹ After the fall of the Soviet Union, an Inter-State Commission for Water Coordination (ICWC) was established to preserve the Soviet era resource-sharing system until a new agreement could be reached. The five countries reached a framework agreement in 1998 on energy sharing, which includes a timetable for water release from Kyrgyzstan to neighboring countries, though its implementation has largely been ineffective.² This analytical brief will cover the issues of water supply, water use and the economy, progress on global water targets, and foreign assistance towards the water sector in countries



along the New Silk Road: a U.S. government initiative seeking to improve economic linkages between these five Central Asian countries, Afghanistan, India, and Pakistan.

WATER SUPPLY

Today, as shown in Figure 1, the Kyrgyz Republic and Tajikistan provide for the majority of their water needs domestically, while Kazakhstan and, to a greater extent, Uzbekistan and Turkmenistan, rely heavily on their neighbors for water resources. Turkmenistan has the highest dependency ratio of all countries covered, relying on foreign countries for 97 percent of its water. In South Asia, India is considerably more self-sufficient than Pakistan in terms of water dependency, relying on neighboring countries for 30.5 percent of its water resources, compared with Pakistan's 77.7 percent.

Despite the wide variation in water dependence amongst New Silk Road countries, diminishing water supply from a variety of sources poses threats for all countries covered in this brief. Central Asian countries primarily draw their water from the Syr Darya and Amu Darya rivers, which feed into the Aral Sea north of Uzbekistan and account for more than 90 percent of the region's river water.³ However, as a result of extensive water withdrawal from the rivers for irrigation, the water flow into the Aral Sea has declined significantly and the volume of the sea's water resources has fallen by 75 percent over the last 40 years.⁴ Today, sea levels have declined to the point that the Aral Sea has



This publication was produced for the United States Agency for International Development. It was prepared by the Economic Analysis and Data Services team. actually split into two separate bodies of water: the Northern Aral Sea within Kazakhstan and the South Aral Sea, on the border of Kazakhstan and Uzbekistan. Glacial melt threatens to further exacerbate these concerns, with glaciers in the Tien Shan mountain range, which feed Central Asia's rivers, melting at more than four times the global average according to some estimates.⁵

Pakistan and, to a lesser extent, India have significant water supply concerns as well. The New York Times notes that while India stores water through approximately 4,000 major dams, accounting for one-third of its water supply, Pakistan has significantly smaller dam capacity, and reservoirs account for just 9 percent of its water supply. Pakistan primarily draws its water from the Indus River, but like some countries fed by the Syr Darya and the Amu Darya, its per capita water availability has declined significantly in recent years, to levels five times lower than recorded at the time of the country's independence in 1947.⁶ Due in part to the declining resources of the Indus River, approximately 73 million people in Pakistan (38.6 percent of the population) and 180 million people in India (13.7 percent of the population) face severe water scarcity year-round.⁷

The diminishing sources of water and historical tension amongst countries pose the potential for future conflict between countries along the New Silk Road. The Russian ground forces commander in 2012 noted that resource disputes could trigger "local armed conflicts" in Central Asia as populations grow, arable land levels decline, and water supply shrinks.⁸ In South Asia, there have been recent disputes over alleged violations of the Indus Waters Treaty (IWT), which has been in place since 1960 and serves to reduce water conflict between the two countries through mutual agreement. Pakistan is concerned that two proposed hydroelectric projects in India violate the IWT and threaten Indus River water flow into Pakistan, further tightening the country's water supply, while India also claims that Pakistan has violated provisions of the IWT. While the IWT has largely been effective at managing water disputes between the two South Asian countries, there have been reports that Pakistan will escalate this most recent disagreement to the ICC's International Court of Arbitration, further aggravating tensions between India and Pakistan.⁹

WATER USE AND THE ECONOMY



Due to the arid climate of most of South and Central Asia, water in the region is primarily withdrawn for use in the agricultural sector, which relies on a consistent water supply for irrigation of crops. As shown in Figure 2, as of 2014 New Silk Road coun-

tries use more water for agriculture than any individual region, at an average of 89.7 percent, compared to a global average of 59.6 percent and averages in North America and Europe of less than 30 percent. Of the regions covered, the Middle East and North Africa, which also exhibits a generally dry climate, consumes the next-largest proportion of its water for agriculture. However, countries in this region withdrawal freshwater for agricultural use at a rate about 16 percentage points lower than in New Silk Road countries. One contributing factor to the high water use for agriculture is the lack drainage systems for irrigated water; lower investment in drainage since the collapse of the Soviet Union



which encompasses human and household needs such as drinking, cooking, cleaning, and sanitation. Kazakhstan uses the smallest percentage of total freshwater withdrawal for agriculture amongst the countries covered in this brief, at 66.2 percent, and the highest percentage for industry, at 29.6 percent. This can be explained primarily by the relatively small agricultural sector in Kazakhstan: agriculture value added only accounts for 4.7 percent of the country's GDP, about one-quarter of the regional average of 18.6 percent.

Although Tajikistan relies on agriculture value added for a greater proportion of its GDP than any other New Silk Road economy (27.4 percent), only Uzbekistan, Kazakhstan, and India's agricultural sectors use a smaller share of their economy's water resources than Tajikistan. In Afghanistan, where the agricultural sector comprises 23.5 percent of GDP, the third-highest of New Silk Road economies, water is withdrawn almost exclusively by the agricultural sector, with domestic and industry uses accounting for less than 1.5 percent of total water withdrawal.



Water supply concerns often have substantial impacts on the business and investment climate within countries. The World Bank's Enterprise Surveys project collects data at the firm level to assess a country's business environment, including issues related to water connections. Of the two indicators related to water, there is wide variation across countries in the percentage of firms expected to give gifts to obtain a water connection, ranging from 80 percent in Afghanistan to a reported 0 percent in Uzbekistan. Countries with high values for this indicator—such as Afghanistan and the Kyrgyz Republic-might have

greater levels of corruption in the water sector. There is much less variation across countries in the number of water shortages firms experience in a typical month. Firms in all countries except Pakistan typically go longer than one month without a disruption in water supply. However, in Pakistan, firms average 5.9 water insufficiencies in a typical month.

ACCESS TO SAFE WATER

Most New Silk Road countries have made significant progress in the first years of the twenty-first century towards expanding access to safe drinking water. As shown in Figure 5, in 1992 only three countries included in this analysis provided safe drinking water to at least 85 percent of their populations. In the subsequent 23 years, most countries made significant progress towards expanding safe drinking water access. Afghanistan, where only 21.3 percent of the population had safe drinking water in 1992, increased this figure by more than 160 percent by 2015. Despite this significant progress, 45 percent of the country's population still lacks access to safe water. The two countries with the highest performance on this indicator in 1992, Kazakhstan and Uzbekistan, actually regressed slightly by 2015. Note that Turkmenistan had insufficient data for this comparison, but the latest available data (2006) indicate that approximately 60 percent of the country's population had access to safe drinking water, showing a minimal increase from 1997.

PROGRESS ON GLOBAL GOAL TARGETS

Water is given a prominent focus in the Sustainable Development Goals (SDGs), adopted in September 2015 to replace the Millennium Development Goals (MDGs), with goal 6 being 'Ensure availability and sustainable management of water and sanitation for all.'¹¹ A total of eleven indicators have been selected to monitor the targets under this goal, seeking to cover



topics ranging from ambient water quality to the implementation of integrated water resources management plans.¹²

Figure 6: Water stress in the New Silk Road freshwater withdrawal as a proportion of available freshwater resources				
			0.0 200.0	
Country	2002	2007	2012	
Kazakhstan	17.20	18.30	18.40	
Afghanistan	31.00			
Kyrgyzstan	42.70	32.60		
India	31.90		33.90	
Tajikistan	53.20	51.10		
Pakistan	69.90		74.40	
Uzbekistan	110.00	100.60		
Turkmenistan	100.60	112.50		
NOTE: Blank boxes indicate Source: UN Global SDG Inc	e missing values licators Database	e		

Figure 6 shows progress across countries on a key SDG indicator related to water stress: freshwater withdrawal as a proportion of available freshwater resources. Low values for this indicator suggest that water does not present a challenge for sustainability and economic development while increases in the value indicate higher water stress, and a potential threat to the sustainability of natural resources and development.¹³ Although Kazakhstan is dependent on neighboring countries for about 41 percent of its water consumption, the country typically uses the smallest proportion of total available water resources of all New Silk Road countries, at just 18.4 percent in 2012. Five other countries (Afghanistan, Kyrgyz Republic, India, Tajikistan, and Pakistan) have consistently used less than the total amount of renewable freshwater resources available to them since the indicator was first measured in 2002.

However, two countries of concern for this indicator are Uzbekistan and Turkmenistan, which also have the highest rates of water dependency in Central Asia. Uzbekistan has made some progress on this indicator, reducing its water consumption from 110 percent of what it had available in 2002 to 100.6 percent in 2007; however, the latest measure still shows the country consuming more of its renewable water resources than available. Turkmenistan is also a country of concern, using an increasing percentage of its total water resources, surpassing full capacity in 2002 and growing to 112.5 percent in 2007.

The United Nations SDG data also reveal the need for enhanced data collection efforts to monitor global goal targets in the water sector. The online UN Global SDG Indicators Database currently only displays data for six of the eleven indicators related to water. Furthermore, for the SDG water stress indicator, no country has data for all three survey periods (2002, 2007, and 2012), and Afghanistan only has data for 2002, making it impossible to track progress over time. In total, one-third of the New Silk Road countries' data points are missing for this indicator, with only three countries reporting data for 2012.



FOREIGN ASSISTANCE TOWARDS WATER ALONG THE NEW SILK ROAD

The majority (63 percent) of U.S. assistance to New Silk Road countries in the water supply and sanitation sector from 2005 to 2014 went to Afghanistan, reflecting the high U.S. presence in the country. Pakistan received the second-largest share of bilateral aid, at more than \$100 million over the same 10-year period. The large value of aid reflects an immediate need for assistance to the country; a recent World Bank study deemed Pakistan 'one of the most water-stressed countries in the world' due to its rising population.¹⁴ Central Asian countries received significantly smaller amounts of assistance, though it is important to note that some funds for certain activities, including the Partnership for Enhanced Engagement in Research (PEER) activity, described later, are allocated globally and thus cannot be attributed to individual regions or countries.

U.S. foreign assistance to the water and sanitation sector is broken down by specific areas that the aid is intended to support, called purposes by the Organization for Economic Cooperation and Development's Development Assistance Committee (OECD/DAC). The majority (57 percent) of funding towards water and sanitation in New Silk Road countries from 2005 to 2014 went to water sector policy and administrative management. The second largest purpose of water and sanitation funding in the region was the development of large water supply and sanitation systems, with over half of this funding going to Pakistan. The remaining \$4.3 million in funding towards the region for the 10 year period

5 USAID Economic Analysis and Data Services (EADS)

make up less than one percent of total water and sanitation assistance to the region and include drinking water supply, waste management, education and training, and conservation.

Figure 8: U.S. assistance to New Silk Road countries for water supply and sanitation by DAC purpose 2005-2014 obligations, constant U.S. dollars

DAC Purpose	
Water sector policy and administrative management	\$270,263,646
Water supply and sanitation - large systems	\$199,821,147
Basic drinking water supply and basic sanitation	\$3,370,018
Waste management / disposal	\$546,742
Education and training in water supply and sanitation	\$381,415
Water resources conservation (including data collection)	\$9,000
Source: LISAID Foreign Aid Explorer	

U.S. development projects in the wa-

ter sector in Central Asia are often coordinated at the regional level and water plays a prominent role in USAID's Regional Development Cooperation Strategy 2015-2019 for Central Asia. One of three development objectives for the region is 'enhanced regional cooperation on energy and water resources,' seeking to convert water from a source of conflict to an area of cooperation amongst countries.¹⁵ Two primary USAID efforts towards this objective are the PEER and Smart Waters activities. The activities seek to foster communication about water concerns 'outside of high-level inter-government channels,' instead reaching out to members of civil society, academia, policymakers, and local actors to facilitate grassroots change and cooperation between countries.¹⁶ The PEER activity supports university-led seminars, workshops, and research on improved management of shared water resources in Central Asia. The Smart Waters activity, on the other hand, focuses on sharing of best practices in the management of water resources amongst water managers in Central Asia, in addition to supporting local water suppliers. USAID also provides support to multilateral water efforts, including the Central Asia Energy and Water Development Program, managed by the World Bank, and programs in the water sector led by UN Regional Centre for Preventive Diplomacy for Central Asia (UNRCCA).¹⁷

HIGHLIGHT: ROGUN HYDROPOWER PROJECT

The Rogun Hydropower project in Tajikistan is an illustrative and timely example of the competing energy and water supply needs of Central Asian countries and the sensitivity surrounding these issues. The proposed Rogun dam would be the tallest in the world and, providing Tajikistan with much-needed energy in the winter months, reducing its reliance on imported gas and oil from Uzbekistan and Turkmenistan, and opening up the possibility of energy exports to Afghanistan, Pakistan, and India.¹⁸ The project also serves as a point of national pride, with Tajik President Emomali Rakhmon declaring in 2010 that the dam has turned into an 'arena of labor, bravery and generosity, trials of heroism, and, more so, our national idea.'¹⁹

Although the dam has been under construction since 1982, the collapse of the Soviet Union, civil strife in Tajikistan, and objections from neighboring countries prevented the project from moving forward until well into the 2000s.²⁰ Uzbekistan, in particular, raised concerns that the project would have downstream impacts, predominantly on the supply of water used to irrigate cotton crops, and the World Bank was tasked with conducting an independent assessment of the project to determine its technical viability and social and environmental impact. Although the study stipulated that any negative impacts on downstream summer water flow would need to be sufficiently mitigated, the assessment concluded that 'it is possible to safely build and operate a dam at the Rogun site.'²¹ The Rogun project continues to cause friction and erode inter-regional cooperation between riparian neighbors, even after the World Bank's effective green light. According to The Diplomat, prior to the World Bank's assessment, Uzbekistan's President Islam Karimov proclaimed that the dam dispute could escalate to 'not just serious confrontation, but even wars could be the result.' After Tajikistan signed a \$3.9 billion contract with an Italian firm to aid in the construction of the Rogun dam in mid-2016, Uzbekistan's Prime Minister penned a letter in July 2016 to Tajikistan's Prime Minister noting his continued displeasure and calling the project a remnant of 'Soviet megalomania.²² The Rogun project highlights the sensitive nature of the development of the water and energy sectors in Central Asia, and the fragile relationships underpinning cooperation in the region.

CONCLUSION

The historical tensions over the issue of water in South and Central Asia show few signs of resolution in the near future: resource-sharing agreements amongst former Soviet countries carry minimal weight, while India and Pakistan also face diminishing resources from the Indus River. There are, however, some signs of improvement for the water sector in many of these countries: most have made significant progress on providing safe drinking water to their citizens, and some have made strides to consume less of their total available water resources. U.S. assistance to the region has consisted primarily of improving management of the water sector, enhancing inter-state cooperation on water issues, and developing large water and sanitation systems to improve the infrastructure in each country, priorities which fall in line with the issues illuminated in the World Bank's Enterprise Surveys data.

For questions or more information, please contact the author of this publication, Ryan Whalen at rwhalen@usaid.gov. To access the data, please visit the EADS International Data & Economic Analysis (IDEA) website at idea.usaid.gov.

DISCLAIMER: The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development (USAID) or the United States Government.

Sources:

I International Crisis Group, Water Pressures in Central Asia, September 2014, https://www.crisisgroup.org/file/1172/ download?token=mgbFj7RC.

2 Bernauer, Thomas and Tobias Siegfried, Climate change and international water conflict in Central Asia, Journal of Peace Research, 49 (2012): 227-239.

3 International Crisis Group, Water Pressures in Central Asia, September 2014, https://www.crisisgroup.org/file/1172/ download?token=mgbFj7RC.

4 Food and Agriculture Organization of the United Nations, Irrigation in Central Asia in figures: AQUASTAT Survey-2012, 2013. http://www.fao.org/docrep/018/i3289e/i3289e.pdf.

5 The Japan Times, "Glaciers in Central Asia shrinking fast: study," August 29, 2015, http://www.japantimes.co.jp/ life/2015/08/29/environment/glaciers-central-asia-shrinking-fast-study.

6 The New York Times, "Starved for Energy, Pakistan Braces for a Water Crisis," February 12, 2015, http://www.nytimes.com/2015/02/13/world/asia/pakistan-braces-for-major-water-shortages.html.

7 Science Advances, "Four billion people facing severe water scarcity," 2016, http://advances.sciencemag.org/content/ advances/2/2/e1500323.full.pdf.

8 International Crisis Group, Water Pressures in Central Asia, September 2014, https://www.crisisgroup.org/file/1172/



7 USAID Economic Analysis and Data Services (EADS)

download?token=mgbFj7RC.

9 The Times of India, "Avail Indus Water Treaty norms to resolve matters: India to Pakistan," July 16, 2016, <u>http://timesofindia.indiatimes.com/india/Avail-Indus-Water-Treaty-norms-to-resolve-matters-India-to-Pakistan/article-show/53241598.cms</u>.

10 Food and Agriculture Organization of the United Nations, Irrigation in Central Asia in figures: AQUASTAT Survey-2012, 2013. <u>http://www.fao.org/docrep/018/i3289e/i3289e.pdf</u>.

11 United Nations Development Program, "Sustainable Development Goals (SDGs)," <u>http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda.html</u>.

12 United Nations Economic and Social Council, Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, February 19, 2016, <u>http://unstats.un.org/unsd/statcom/47th-session/documents/2016-2-IAEG-SDGs-Rev1-E.pdf</u>.

13 United Nations Statistics Division, SDG Indicators Metadata Repository, <u>http://unstats.un.org/sdgs/metadata/files/</u><u>Metadata-06-04-02.pdf</u>.

14 The Guardian, "The real threat to our future is peak water," July 6, 2013, <u>https://www.theguardian.com/global-de-velopment/2013/jul/06/water-supplies-shrinking-threat-to-food</u>.

15 U.S. Agency for International Development, "Central Asia Regional Development Cooperation Strategy, 2015-2019," <u>https://www.usaid.gov/sites/default/files/documents/1861/RDCSCentralAsia.pdf.</u>

16 U.S. Agency for International Development, "Regional Water Management Forum," <u>https://www.usaid.gov/news-in-formation/fact-sheets/regional-water-management-forum-rwmf</u>.

17 U.S. Agency for International Development, "Central Asia Regional Development Cooperation Strategy, 2015-2019," <u>https://www.usaid.gov/sites/default/files/documents/1861/RDCSCentralAsia.pdf.</u>

18 Directorate-General for External Policies of the European Parliament, The World Bank considers feasible the building of the Tajik Rogun Dam, September 2014, <u>http://www.europarl.europa.eu/RegData/etudes/IDAN/2014/536392/</u> <u>EXPO_IDA(2014)536392_EN.pdf</u>.

19 The Jamestown Foundation, "Will Tajikistan Successfully Construct Rogun?" January 26, 2010, <u>http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=35955&tx_ttnews%5BbackPid%5D=7&-cHash=53f9274652#.V7NzAfmANBc</u>.

20 World Bank, Key Issues for Consideration on the Proposed Rogun Hydropower Project, September 2014, http://www.worldbank.org/content/dam/Worldbank/document/eca/central-asia/World%20Bank%20Note%20-%20 Key%20Issues%20for%20Consideration%20on%20Proposed%20Rogun%20Hydropower%20Project_eng.pdf.

21 World Bank, Key Issues for Consideration on the Proposed Rogun Hydropower Project, September 2014, http://www.worldbank.org/content/dam/Worldbank/document/eca/central-asia/World%20Bank%20Note%20-%20 Key%20Issues%20for%20Consideration%20on%20Proposed%20Rogun%20Hydropower%20Project_eng.pdf.

22 The Diplomat, "Tajikistan's Rogun Dam Rankles Uzbekistan," July 21, 2016, <u>http://thediplomat.com/2016/07/tajiki-stans-rogun-dam-rankles-uzbekistan/</u>.