

Supporting Water Programming in the Sahel

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Introduction

The Sahel region of Africa is one of the most climate-affected regions in the world. Temperatures are rising **1.5 percent faster** than the global average rate. Increasing temperatures and irregular rainfall have resulted in regular droughts and floods that **disrupt traditional agropastoral patterns** and contribute to broader instability and fragility. Lake Chad, a crucial water and livelihood source for 30 million people in the Sahel, has shrunk by 90 percent since 1960, **displacing 2.3 million people** and creating a humanitarian crisis. Periods of **prolonged and intense drought** and improper land use have degraded much of the soil in the Sahel. In Burkina Faso, **over one-third of farmland is degraded**, meaning some land cannot sustain agriculture even when there is enough rainfall. A **rapidly increasing population**, coupled with the impact of climate change, means more people are competing for diminishing water resources. This results in a vicious cycle of population growth, land degradation, and food instability. The greater the population, the greater the demand for food and the greater the use of unsustainable farming practices, exacerbating food scarcity and demand for additional farmland.

As the U.S. Agency for International Development (USAID) updates its water strategy, it is important to examine the interplay of economic and conflict fragility, irregular migration, climate change, and water availability in the Sahel to identify interventions for greater resilience. In a region like the Sahel, water is critical to resilience and adaptation to the effects of climate change. While water strategy is not a cure-all, it can improve outcomes for other challenges. The Biden administration recently announced the new **Partnership for Global Infrastructure and Investment** (PGII), an initiative to mobilize private capital investment in infrastructure. The four pillars of this initiative—climate and energy security, digital connectivity, health and health security, and gender equality and equity—could support additional investments in water infrastructure.

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CSIS recently conducted a tabletop exercise with a group of development and foreign policy experts to examine the interplay of these issues in the Sahel. The group began with a resource allocation exercise that asked them to allocate different types of water projects to countries in the region. The group tested these allocations and assumptions through two scenarios: (1) a Black Sea cascade, in which the war in Ukraine brought on a food crisis by triggering farmer-pastoralist violence and other unrest due to rising food prices, and (2) the Covid-19 pandemic redux, in which political upheaval followed a spike in Covid-19 cases in the Sahel as governments struggled to respond. The tabletop exercise yielded the following insights:

1. Project sustainability and resilience are key and require local ownership. The U.S. government and its partners should seek to
 - develop strong analysis before beginning programming to identify the right local partners, including government, civil society, and other local actors;
 - build trust with communities by working through local structures that have communities' trust and respect; and
 - invest early in communities and the broader enabling environment to ensure resiliency of programming and projects.
2. Learning and adaptation must be built into projects to ensure they can respond to the unpredictability of a region like the Sahel. These feedback loops are essential, especially during disruptions such as the Covid-19 pandemic or conflict in Ukraine.
3. Strong local partners and an existing U.S. presence help projects succeed.
4. Digitization is important to the feedback loop and sustainability of projects. It helps communities adapt to new crises.

This paper provides an overview of the interplay of water with public health, climate change, migration, economic and conflict fragility, and food security in the Sahel. It also summarizes the CSIS tabletop exercise, insights from the exercise, and policy recommendations for USAID and the U.S. government.

The Sahel Region

The Sahel is an area south of the Sahara desert that stretches from the Atlantic coast to the Red Sea. The region includes all or part of Mauritania, Senegal, Mali, Burkina Faso, Niger, Chad, Nigeria, Cameroon, Sudan, South Sudan, Eritrea, and Ethiopia. The region is semiarid, though less dry and desert like than the Sahara to the north. The Sahel is prone to drought and includes nomadic groups, semi-pastoral farmers/herders, mostly settled communities, and, increasingly, urban areas. Climate change has exacerbated these drought conditions, making the region more susceptible to disruptions. This has increased the region's overall fragility and in turn has destabilized countries, generating conflict, increasing migration, and creating spillover effects in surrounding countries like Ghana and Côte d'Ivoire. Given the cycle of environmental and man-made disasters in the Sahel, the region is a perennial recipient of humanitarian assistance.

Health Impacts of Water

Access to clean and safe water is essential for human health. According to UNICEF, diarrheal diseases caused by contaminated water are the **fourth-leading cause of death** for children under five and cause more than 300,000 deaths annually. Clean water has two main dimensions: drinking water and access to sanitation facilities.

DRINKING WATER

How people access drinking water plays a large role in how clean a water source is. Boreholes (wells) and piped water tend to be much cleaner than surface water (ponds, lakes, streams, etc.), largely because they are less exposed to animals and the many bacteria and diseases animals carry. Additionally, the shorter the distance traveled after water collection, the smaller the risk of contamination and, thus, the safer the water. Access to safe drinking water in the Sahel varies by country, but in most cases the water remains dangerous to human health. In Chad, the country with the least access to safe water, **according to the United Nations**, nearly 50 percent of the population is exposed to drinking water with very high levels of E. coli, and just **6 percent of the population** uses safely managed drinking water.

While Chad fares the worst in safe water access, other Sahel countries have widely varying levels of safe water access. Over 50 percent of people in **Burkina Faso** and **Niger** lack access to safe drinking water. One success story comes from Mali, where just **7 percent of the population** lacks access. This success is largely credited to numerous **humanitarian organizations**, specifically UNICEF, which along with other partners provided water supply services to more than **194,500 people**.

SANITATION AND HEALTH

Broader access to water and sanitation facilities also has important implications for health. One basic aspect of sanitation is the use of handwashing facilities, which depends on the availability of clean water. Access to handwashing facilities ranges from 25 percent of the population in **Chad** to just 9 percent in **Burkina Faso**. In addition, suitable sanitation facilities are essential for preventing water contamination. The share of the population with access to safely managed sanitation systems ranges from 22 percent in **Burkina Faso** to just 10 percent in **Chad**. Success in one area—access to safe drinking water, handwashing facilities, or suitable sanitation facilities—does not necessarily mean success in another. For instance, significantly more people in Mali have access to safe drinking water than in Chad, but people in Chad have comparatively greater access to handwashing facilities. These discrepancies suggest that success is not necessarily a result of greater capacity, better governance, or even country-level factors but of successful programs devoted to one outcome. It may be fruitful to look to successful programs for best practices to apply throughout the region.

Water Scarcity Externalities

CONFLICT AND VIOLENCE

The effects of water scarcity in the Sahel extend beyond drinking water access and sanitation to conflict, food security, and migration. Scholars have widely explored the relationship between irregular rainfall and conflict. **One study** observed the effects of deviations from average rainfall on various types of conflict, concluding that rainfall variability is associated with increases in all types of political conflict across Africa. **Another study** supported these findings, arguing that violence in the Sahel can be attributed to water scarcity-induced migration. As the amount of viable land decreases, farmers and herders expand their land use, and conflict arises over both water and land rights.

In a separate study, [McGuirk and Nunn \(2021\)](#) explored the relationship between rainfall and farmer-herder violence in Africa, finding that a decrease in rainfall of one standard deviation in an area occupied by pastoralists results in a statistically significant increase in violence in neighboring farming communities but only when the farmers and herders are of different ethnicities.¹ These results were seen for both state and nonstate violence, meaning that water scarcity-induced conflict can involve national militaries and police forces, in addition to farmers and herders. The authors suggested that conflict is driven by lack of water resources but also factors like the ethnicity of farmer and herder communities.

AGRICULTURE AND FOOD

Agriculture and water are extremely interrelated. Agriculture is the economic backbone of many nations in the Sahel, making up [45 percent of the region's GDP and employing over 50 percent of the labor force](#). Increasing temperatures, unsustainable land-use practices, and irregular rainfall have created a perfect storm for desertification or degradation of farmland. Desertification can make farming nearly impossible. Coupled with a rapidly increasing population, this creates a situation of food insecurity.

Desertification also has contributed to conflict in the region. To feed the growing population, farmers have expanded their land use northward, encroaching on land traditionally occupied by nomadic herders, resulting in deadly conflicts. Additionally, desertification has contributed to a food crisis in the Sahel. Between 2017 and 2018, the number of children under five suffering from severe malnutrition [rose by 50 percent](#) to a 10-year high of 1.3 million. The Covid-19 pandemic and rising grain prices have [exacerbated this food crisis](#). In May 2022, the United Nations warned that [18 million](#) people in the Sahel were on the brink of starvation.

MIGRATION

Violence and climate-related factors have resulted in a [tenfold increase](#) in the number of displaced people in the region, from just over 200,000 in 2013 to 2.1 million in early 2021. The United Nations High Commissioner for Refugees (UNHCR) cites a circular relationship between drought, migration, and conflict: climate change forces people to migrate in search of better opportunities, migration causes conflicts over territory and water rights, and conflict increases migration.

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[Climate migration](#) is a significant factor in the region, though it is not unique to the Sahel. As global temperatures continue to rise, environmental factors compel people to leave their homes and migrate to better opportunities. Climate migration is driven largely by three mechanisms: temporary climate-related shocks, permanent changes to the area, and indirect effects precipitated by preceding factors. All three mechanisms are at play in the Sahel. Temporary climate shocks, like the [flooding in 2020](#), displace people by making places uninhabitable for a short time. After the initial displacement, some choose not to return and instead migrate elsewhere. Permanent or longer-term changes to the area like drought and

¹ There are varying estimates of the increase in violence, ranging from approximately 14.6 percent (Armed Conflict Location & Event Data Project) to 40.12 percent (Uppsala Conflict Data Program).

desertification make life in an area difficult. Without the tools to be resilient, many choose to migrate in search of better opportunities and easier lives. Finally, migration can sometimes result in conflict and violence, which further incentivizes migration.

GENDER

Water availability also has implications for gender equality. When water is not easily accessible, the burden of traveling to collect it often falls on girls and women. A [2016 UNICEF report](#) shows that, globally, girls and women spend 200 million hours a day collecting water. This presents a high opportunity cost to obtaining education or employment. With more accessible, local clean water options, girls and women can spend their time on more productive pursuits. Additionally, access to clean water and adequate sanitation facilities can [affect girls' education](#). Inadequate facilities, particularly at schools, can result in girls missing significant instruction time and even choosing to drop out.

U.S. Government Water Programming in the Sahel

While more action is needed to mitigate the current water crisis, governments and multilateral aid agencies are already taking action on water policy. The U.S. government, through USAID and the Millennium Challenge Corporation (MCC), has an extensive footprint across the Sahel, including significant water-focused programming. USAID, under its water, sanitation, and hygiene (WASH) program, has identified 21 high-priority countries for targeted water programs, including two in the Sahel: [Mali](#) and [Senegal](#). In both countries, the WASH program has focused on improving access to clean drinking water, building sanitation systems, and developing small-scale rural irrigation systems to improve drought resilience.

More specifically, USAID has provided significant support for using water programming to develop long-term resilience in the Sahel. This includes the [Resilience in the Sahel Enhanced](#) (RISE) program, which seeks to mitigate climate shocks and food insecurity in the region through increased access to safe drinking water and improved sanitation practices. In addition, USAID and the MCC have invested money to support construction of new irrigation systems for agriculture across the region in [Senegal](#), [Mali](#), Niger, and other countries. Programming includes support for improved water resource management and WASH projects.

Other donors have also recently supported water programming, such as Agence Française de Développement (AFD), France's development agency, which devoted 8 percent of its commitments in 2021 to financing water-related projects. Burkina Faso and Chad were key areas of focus. Hoping to address some of the causes of desertification in the region, the agency financed projects to improve water governance and access to drinking water in crisis situations. The World Bank is also involved in the sector, devoting \$1.4 billion to water projects in Mali, Burkina Faso, Chad, Nigeria, and Senegal.

CSIS Tabletop Exercise and Recommendations

Investing in safe water systems can increase resilience to climate shocks, allowing crops and livestock to survive periods of insufficient rainfall. Boreholes, well-built wells, and piped water systems are generally much safer than surface water. Investing in these technologies can prevent people from relying on contaminated water sources. Having water close to one's home or village reduces the amount of time the water must be carried, decreasing both the likelihood of water contamination and the burden placed on women and girls responsible for retrieving water.

In June 2022, the Biden administration announced the PGII, aimed at improving international infrastructure through high-quality financing and technical support. The PGII focuses on four key priorities: climate and energy security, digital connectivity, health and health security, and gender equality and equity. While water-related projects are not explicitly part of the program, access to clean water is a critical component of three of the four priorities. Further, water services can be enhanced under the pillar of digital connectivity.

CSIS conducted a tabletop exercise to explore how to make USAID programming relevant to PGII and refine USAID's approach to water issues in the Sahel. The tabletop exercise convened a group of think tank fellows, military professionals, and development practitioners with both government and nongovernment experience to conduct a stress test of water program priorities in the Sahel. The group divided into two teams of five to six people to recommend a mix of WASH, water resource management (WRM), and water productivity (WP) projects that could either (1) attract support from other G7 partners or public-private partnerships consistent with the goals of PGII or (2) support larger interagency strategies, ranging from countering violent extremism to reducing the impact of malign foreign actors (including great power competitors) across the Sahel.

To start, each group member was asked to recommend three water projects, specifying the country, relevant PGII pillar, and type of water intervention (WASH, WRM, or WP). Then each group developed a consolidated team strategy, created recommendations for three programs, and assessed the likelihood these projects would attract additional support from G7 partners or the private sector.

- Team 1 focused on the strategic objectives that the water programs would help fulfill, such as deterring China, building closer partnerships with countries facing increasing indebtedness to China, and building local capacity to maintain resilient programs. The team decided to focus investments on countries deemed “preferred partners” for the United States, such as Nigeria, South Sudan, and Senegal, believing that strong bilateral relations would yield more resilient programs. The group also discussed the need for local ownership of programs through co-ops or governments.
- Team 2 focused on how to organize its strategy: whether to concentrate on a geographic country grouping or existing U.S. government priorities in the region. The group decided to focus on a specific area (Burkina Faso and Mali) so water programming would support broader countering violent extremism (CVE) efforts and counter malign actors (e.g., Russia and China) in the region. The team agreed that understanding local dynamics is central to success, as is integrating local stakeholders into the program design to provide monitoring and resilience.

In making allocations across the region, the two teams agreed that water programming was fundamental to addressing more complex human security challenges in the region. At a macro level, players identified **access to improved data and enhanced contracting capability and capacity** as necessary to enable more dynamic water programming in the Sahel. Potential challenges to effective water policy in the region stem largely from the region's instability and fragile governance. While water services are much needed, country conditions can make both the construction and maintenance of water infrastructure difficult.

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Following this initial exercise, the two teams responded to two crisis scenarios by deciding whether to shift their initial allocations. The first scenario dealt with the Russian invasion of Ukraine and its effect on global food prices. This, combined with persistent drought in the region, created a complex humanitarian emergency, setting off violent farmer-herder conflict that triggered additional migration. The second scenario dealt with a resurgence of Covid-19, which caused a spike in hospitalizations and deaths in the region. The effects of the Covid-19 pandemic were compounded by political unrest, with Chad delaying presidential and local elections, Senegal experiencing unrest associated with its national assembly elections, and contested elections in Osun State in Nigeria.

Under both scenarios, the teams debated whether to adapt their programming choices to meet the new crises or remain focused on long-term results. There was a general sense that if projects proved at least somewhat resilient, sustaining investments would provide stability in the face of mounting crises. Both teams felt that adapting the projects would help shift funding to meet the humanitarian impact of the crises in both scenarios. They noted that partnering with local groups would make it easier to shift funds because local organizations would have a better sense of where adapted funds could make the most impact. Under the Covid-19 scenario, both teams agreed there was a clear need to shift some programming toward WASH activities to help stem the increase in infections.

RECOMMENDATIONS

The tabletop exercise produced several recommendations to help USAID and the U.S. government improve their water interventions in a complex region like the Sahel, which often faces overlapping crises. As listed above, recommendations to consider include the following:

1. Project sustainability and resilience are key and require local ownership. The U.S. government and its partners should seek to
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 - build trust with communities by working through local structures that have communities' trust and respect; and
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Several of these recommendations align well with the Biden administration's current approach. USAID and other U.S. government agencies should work to incorporate them into future programming in the Sahel and other complex regions. ■

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