White House Action Plan on Global Water Security

THE WHITE HOUSE
WASHINGTON

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Introduction

The Biden-Harris Administration recognizes the critical role of sustainable water systems and the transformational power that water access has in the life of each person on earth. From its most basic role as the source of life to its advanced role in powering global economies, water matters. Still, its ubiquity in everyday life risks leading us to take it for granted — while global trends in population growth, urbanization, environmental degradation, deforestation, and climate change pose growing challenges to water security around the world. Here at home, water crises are becoming more frequent and intense. Historic droughts threaten our supply of water, and failing infrastructure and chronic underinvestment deprive our most vulnerable communities of safe drinking water. Lack of sanitation threatens public health, individual safety and dignity, equity, and the protection of freshwater resources; extreme weather events intensify these risks where improved sanitation is unavailable. As the source of both life and livelihoods, water security is central to human and national security.

Domestically, the Administration is tackling a spectrum of water security challenges. Through the Bipartisan Infrastructure Law, historic investments are being made to replace lead pipes and deliver safe drinking water to families and children. From rural towns to struggling cities, the legislation will invest in water infrastructure, including in Tribal Nations and overburdened and underserved communities that need it most. That includes billions of dollars in funding for projects across the country to build new water reuse, efficiency, storage, and conveyance facilities that secure and grow our water supplies. Moreover, through the Justice40 Initiative,[1] agencies are aiming to direct 40 percent of the overall benefits from investments in critical clean water infrastructure to disadvantaged communities.

Millions of Americans feel the effects of climate change each year when their roads wash out, schools and businesses flood, or power goes down due to extreme weather and climate-related disasters. The Bipartisan Infrastructure Law repairs and rebuilds our Nation's infrastructure — with a focus on climate change mitigation, resilience, equity, and safety. This legislation represents the largest investment in the resilience of physical and natural systems in American history. The Administration has also committed to conserving 30 percent of U.S. lands and waters by 2030, which will help promote resilience and conserve important watersheds. In addition, at the executive level, President Biden's National Climate Task Force has launched multiple interagency working groups to build resilience across the country — including the Drought Resilience Interagency Working Group.

These efforts at home bolster longstanding U.S. Government contributions and leadership internationally on water security (including sanitation and hygiene). As the world becomes increasingly water insecure, the significance of water security in U.S. foreign policy and national

[1] President Biden's Executive Order on Tackling the Climate Crisis at Home and Abroad (E.O. 14008) created the government-wide Justice40 Initiative, with the goal of delivering 40 percent of the overall benefits of relevant federal investments (including climate, clean energy, and water) to disadvantaged communities.

security goals is coming into sharper focus. The 2021 U.S. Intelligence Community's National Intelligence Estimate on Climate Change highlights both the increasing stress on global water resources and the resulting implications for U.S. national security, which include worsening inequality, increasing economic strain, negative health and health security outcomes, and a growing likelihood that water insecurity will become a driver or trigger of instability and subsequent conflict.

Recognizing that global water security is essential to U.S. national security, this Action Plan lays out an innovative, whole-of-government approach to this challenge. It identifies key pillars of this approach that address the full scope of global water issues and will mobilize departments and agencies around concrete actions to achieve our vision of a water-secure world. The Action Plan will be operationalized through the U.S. Global Water Strategy (GWS), mandated by the Congress in the Senator Paul Simon Water for the World Act of 2014; the next revision of the GWS will be submitted to the Congress in early fall 2022 as directed. The approach emphasizes the need to explicitly link water security to national security to improve global resilience; elevate data-driven methods; use resources more efficiently; and work in partnership with states, Tribes, local governments, and Indigenous peoples, as well as non-governmental entities including the private sector.

Problem Statement

Water security is under increasing threat worldwide, facing stressors that range from poor management to accelerating climate change. Although precise effects vary across regions, water insecurity is becoming increasingly widespread — the United Nations (UN) Environment Program's International Resource Panel has estimated that almost half of the world's population will suffer severe water stress by 2030.

UN Water has defined water security as "the capacity of a population to safeguard sustainable access to adequate quantities of and acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water related disasters, and for preserving ecosystems in a climate of peace and political stability." This Action Plan uses a broad definition of water security as outlined by the UN, emphasizing that having "water security" implies sustainable access to safe drinking water, sanitation, and hygiene services, as well as water to sustain ecosystems and for agriculture, energy, and other economic activities.

The global need for water, sanitation, and hygiene (WASH) was enshrined in 2015 as Sustainable Development Goal (SDG) 6, to "ensure availability and sustainable management of water and sanitation for all" by 2030. However, global progress toward this goal has been modest and country-level progress has been disparate. At current rates of progress, UNICEF and the World Health Organization estimate that by 2030, 1.6 billion people will be left without safely managed drinking water services, and 2.8 billion will not have safely managed sanitation. These conditions disproportionately affect women and girls, both because they bear primary responsibility for the labor- and time-intensive process of collecting water and because access to clean and safe water is an issue of reproductive health. For example, at least 500 million women and girls lack adequate water and sanitation infrastructure for menstrual hygiene management, keeping them out of school or away from work due to a lack of facilities and associated stigma.

Economic modeling from the World Bank shows that access to safe water and sanitation is linked to improved economic growth in low-income countries, including through improved household economic security and higher levels of gender equity. Water insecurity also directly constrains economic growth because sectors such as agriculture, health, industry, and energy rely on water availability, quality, and affordability. The nexus of water, energy, and food production exemplifies how improving water access can accelerate economic growth across multiple sectors.

Water insecurity, in many cases driven by ineffective water resource management, has been linked to ongoing tensions in regions such as the Tigris-Euphrates and Lake Chad basins, as well as major protests in Iran during 2021. Water insecurity can lead to internal and cross-border population movements, aggravate human displacement during conflict and disasters — a driver of gender-based violence — and serve as a barrier to return after shocks. There is also an increasing risk that actors controlling the headwaters of key rivers or water infrastructure will monopolize these resources, either to supply domestic needs or to exert pressure on downstream countries.

As municipalities, states, and countries attempt to meet their water needs, there is an increasing risk that they will implement short-term fixes that could compromise water security in the long term, lead to conflict with their neighbors, or exacerbate internal tensions or grievances. Water management can directly influence political outcomes; cooperation on transboundary water resources has also been shown to reduce the risk of inter-state conflict. Therefore, a comprehensive, systems-based approach that transcends political boundaries is needed to address the growing global water insecurity problem and ensure that water strengthens, rather than undermines, U.S. national security.

Approach

In line with the pillars identified below, the United States will apply decades' worth of evidence that water security is essential to the United States' international efforts to increase equity and economic growth, advance gender equity and equality, build inclusive and resilient societies, bolster health and food security, decrease the risk of conflict or instability, and tackle climate change. This Action Plan highlights and reinforces existing U.S. Government tools and resources that explicitly recognize and address the critical links between water security and national security and, for those that insufficiently address these links, can reorient relevant initiatives. Because water security can both contribute to and mitigate these challenges, it is clear that the United States cannot achieve its foreign policy and national security objectives without global water security.

The Action Plan recognizes that integrating water security into national security means ensuring that traditional foreign policy efforts, such as addressing governance challenges and empowering local communities, not only incorporate, but also elevate, water security. It acknowledges the productive work of the U.S. Government's Interagency Water Working Group and the role of the Senator Paul Simon Water for the World Act of 2014 and the U.S. Global Water Strategy in guiding its efforts. It also encourages further collaboration among U.S. departments and agencies, particularly between technical and policy agencies, to enable resources to be more effectively targeted and utilized. It concurrently recognizes the importance of ensuring water security considerations are prioritized under initiatives such as the President's Emergency Plan on Adaptation and Resilience and the global infrastructure initiative President Biden launched with G7 partners.

The United States recognizes the inextricable ties between advancing water security and responding to accelerating climate change. The increasing frequency of extreme weather events such as floods and droughts, alongside increasing global average temperatures, will put further pressure on infrastructure and water resources. At the same time, many of the most immediate climate adaptation challenges, particularly in low- and middle-income countries, are related to water resources. These include the increase in saltwater intrusion to soils and groundwater resources resulting from rising sea levels, especially in low-lying island states and coastal communities. Water also will play a role in climate mitigation. For example, hydropower is the third-largest source of power globally, representing almost 20 percent of power generation, and provides baseload power that is an alternative to high-emissions generation from fossil fuels. Changing weather patterns and fluctuating water resources — which contribute to or exacerbate non-climate drivers of water insecurity such as poor governance — can threaten energy security because many sources of electricity rely on water. Another example of the tension between water and climate goals is desalination, a process that generates clean water but has massive energy requirements and may, in turn, create additional security issues.

However, climate change is just one driver of global water insecurity. Achieving water security will require innovative approaches to concurrently address other challenges, which include poor governance, transboundary issues, pollution and environmental degradation, and inefficient agricultural practices. To respond effectively to these myriad challenges, the United States will emphasize data-driven approaches to decision-making related to international water engagements. In implementing this Action Plan, scientific and technical agencies and the U.S. Intelligence Community will be engaged during all stages of policymaking, diplomacy, and programming. To strengthen and inform decision-making processes, the research and analysis these agencies provide on water resources, including both near- and long-term stressors and trends, will be interpreted and disseminated more widely. In addition, departments and agencies will support partner governments to both collect and use data to improve their decision-making. The U.S. Government will strengthen coordination to facilitate this work, including ensuring the full range of water-related considerations is incorporated into operations, planning, and objectives.

It will be essential to implement this plan in partnership with nongovernmental entities, including the private sector, academia, philanthropy, and local communities, to complement traditional work with country partners. Because water and sanitation needs and challenges vary significantly in time scales and across landscapes and communities, locally driven, adaptable approaches are vital to ensure that U.S. Government efforts address the real needs on the ground in each setting. The vast resources of the private sector will also be essential to creating and financing durable, scalable solutions to water challenges and similarly can benefit from partnership with the U.S. Government.

Acknowledging the efforts that the U.S. Government has already taken to advance global water security, the Administration recognizes that the tools of the U.S. Government are up to this task. Therefore, this Action Plan seeks to elevate, reorient, and streamline these tools to accelerate progress toward achieving global water security during this critical decade.

This Action Plan provides policy direction to support the development of relevant U.S. Government strategies — including the congressionally mandated U.S. Global Water Strategy, which is led by the Secretary of State and the Administrator of the U.S. Agency for International Development through delegated authority from the President and includes individual implementation plans for each department and agency.

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Pillars

Pillar 1: Advancing U.S. leadership in the global effort to achieve universal and equitable access to sustainable, climate-resilient, safe, and effectively managed WASH services without increasing greenhouse gas emissions.

Recognizing the importance of achieving SDG 6, the United States will work with local, national, and subnational governments; regional entities; implementing partners; civil society organizations; and the private sector to drive progress toward achieving universal access to sustainable and safely managed WASH services. This is in line with the Water for the World Act's statement that the United States should "be a global leader in helping provide sustainable access to clean water and sanitation for the world's most vulnerable populations."

Programming will emphasize supporting affordable and sustainable WASH services, including governance, finance, management, and training and capacity building for local water management institutions, service providers, and local communities. Efforts should focus on strengthening service providers' ability to attract financing to provide improved water and sanitation infrastructure and services, such as consistent maintenance, pipelines, and water treatment systems. This also means orienting monitoring and evaluation processes toward progress from basic services to safely managed services. In addition, efforts to provide safe drinking water through processes such as desalination will require assessment of both energy needs and geopolitical considerations to ensure they do not exacerbate challenges in other sectors.

The inequity resulting from water insecurity has detrimental effects on societal, education, health, and economic outcomes. A lack of access to WASH has disproportionate impacts on women and children, especially girls, and other groups or individuals in particularly vulnerable situations or with specific water needs, such as menstrual hygiene; lack of access to clean water also leads to adverse maternal and fetal health outcomes. A significant portion of those most vulnerable are in humanitarian settings, where people are five times more likely to lack access to safe water; a focus on equitable access will need to explicitly address these populations. In addressing this objective, U.S. efforts will acknowledge how improving WASH access achieves not just development goals but broader national security objectives. For example, health security is both essential to national security and dependent on the availability of safely managed and well-governed sanitation and hygiene services and water resources, which also support global pandemic preparedness and response. Therefore, engagements related to health security will incorporate activities to improve water access.

Illustrative examples of U.S. Government efforts to achieve this objective include:

- Identifying and supporting investment funds that can connect communities with financial resources, enabling them to pay for needed water and sanitation infrastructure and connections as well as ongoing maintenance;
- Utilizing relevant U.S. Government agencies to provide loans, loan guaranties, equity, and political risk insurance to support private sector investment in the WASH sector in emerging markets;
- Providing technical support for constructing water treatment, waste water, fecal sludge, and water reuse and recycling systems and improving water and sanitation delivery infrastructure to

minimize source-to-use point contamination, while strengthening governance and finance to ensure infrastructure investment is sustainable;

- Strengthening WASH service providers' technical abilities to plan for climate change and implement measures such as delivery efficiency, leak detection, water and energy conservation, customer engagement, and demand forecasting;
- Integrating WASH services into pandemic or outbreak preparedness and response to improve global health security;
- Leveraging and strengthening existing water quality monitoring programs to ensure access to safe water and to examine water security impacts both at home and abroad; and
- Providing technical assistance related to policy reform and planning to elevate equitable WASH access in local governance structures, as well as programs that drive social and behavioral change, including programs specific to maternal and child health.

Pillar 2: Promoting sustainable management and protection of water resources and associated ecosystems to support economic growth, build resilience, mitigate the risk of instability or conflict, and increase cooperation.

Sustainable water management is essential to ensure that efforts to meet growing global water demand do not add strain to increasingly stressed resources, but instead use these resources effectively and efficiently to provide long-term benefits. This includes nature-based, locally led solutions and other climate-sensitive approaches to manage surface water and groundwater for improved water quality and availability.

The United States' substantial water data collection efforts will allow agencies to provide information about water availability and, together with water management tools, can both facilitate economic development and minimize intra- and inter-state conflict. The United States will focus on supporting partners with high-quality data and providing training on available tools to support data collection and use and application of best practices in water resource planning across sectors. Working with both interagency and non-government partners, scientific and technical agencies will translate their information about countries' and regions' water resource endowments and water use — including identifying root causes of water insecurity and potential water shocks — into accessible formats.

The United States can also provide expert technical assistance that increases the capacity of water management institutions to balance the multiple uses of water, such as supporting municipal use, sustaining ecosystems, and increasing water-use efficiency across sectors. For example, in the agriculture sector, which accounts for roughly 70 percent of global freshwater withdrawals on average, U.S. Government expertise can increase resilience through sharing best practices, including Indigenous and local knowledge, tailored to local growing conditions, such as using efficient irrigation methods, promoting soil health, and restoring watersheds and aquifers. Improved water resource (both surface and groundwater) management and planning, including coordination across political boundaries, will help minimize overexploitation of transboundary resources, including groundwater extraction from essential aquifers. Particularly in regions that are already vulnerable to conflict and fragility, inclusive, evidence-based sustainable management is essential to improve water security and mitigate potential escalation of existing tensions. In

addition, management and planning should include perspectives from the most vulnerable and affected populations, including women and girls.

The United States also recognizes that water insecurity is present not just in low- and middle-income countries, but also in high-income countries. Historically, water challenges in high-income countries — including the United States — have been more likely to affect only specific geographic regions or vulnerable and disadvantaged communities. However, as climate impacts intensify, high-income countries will face increasingly widespread water stress and need to implement sustainable water management practices to preserve economic, energy, and human security. The United States will encourage and support the development of water use agreements among stakeholders who share water resources; such agreements have historically led to increased cooperation and mitigated the risk of conflict.

Illustrative examples of U.S. Government activities to achieve this objective include:

- Improving data collection and using data and information to better understand the locations that could face the greatest water security challenges (e.g., droughts, floods, changes in rainfall patterns) to try to better adapt in advance of crises;
- Developing, deploying, and strengthening water risk monitoring, assessment, and planning tools across the U.S. Government, academia, and industry, and conducting stress tests that also account for climate resilience;
- Developing and deploying modular energy-efficient, low carbon, low-cost technologies for electrified desalination and wastewater resource recovery;
- Providing technical assistance to develop local, and where relevant national, water use plans that are sustainable and equitable for diverse stakeholders, including municipalities and the agriculture, energy, environment, and health sectors, while considering the compounding impacts of climate change;
- Improving and building capacity in climate and hydrological monitoring of watersheds, surface water, and groundwater — including through remote sensing technologies — to enable more accurate, reliable water resource forecasting, including improved drought prediction;
- Expanding data availability and access to tools and information for supporting open-source science, including data collection and sharing at the subnational level;
- Developing and applying advanced integrative, open-source modeling, data-driven machine learning, and hybrid simulation methods to understand and design for sustainable solutions that consider future influences and the resulting, co-evolving human and environmental systems;
- Collaborating with the broad range of global agricultural market participants to foster private investment in water-conserving agricultural technologies and farming practices, in order to address the roughly 70 percent of global water withdrawals accounted for by agriculture;
- Working with the private sector, in partnership with academia and civil society, to disseminate key water data to the global public;
- Advising on the development of cooperative agreements to manage shared water resources, both internal and transboundary, with an emphasis on good governance practices;
- Deploying capacity building and technical assistance to address policy and knowledge gaps related to climate change, water technology challenges, and nature-based solutions; providing

sustainable infrastructure and services; strengthening water-user associations; and developing innovative solutions such as microfinance programs; and

- Providing critical and replicable data, technology, research, training and assessment, and funding and financing solutions through infrastructure investment, regulatory, and knowledge- and capacity-building programs.

Pillar 3: Ensuring that multilateral action mobilizes cooperation and promotes water security.

The U.S. Government will elevate efforts to promote water cooperation through regional and multilateral fora, including but not limited to the Group of Seven (G7), the Group of 20 (G20), the UN, and associated organizations and initiatives.

In addition to providing diplomatic support to facilitate greater collaboration among countries that share water resources, the U.S. Government's vast diplomatic resources will also be used to ensure that action at multilateral fora and through international organizations advances water security. Improved water security can bolster these organizations' initiatives through water's influence on human and national security. Therefore, multilateral diplomatic engagements should identify opportunities where water engagements can lead to stronger regional ties, including through regional economic communities.

The U.S. Government will work through these and other fora to achieve this objective, including:

- **G7:** The global infrastructure initiative launched by the United States and G7 partners identifies water as a key element in three of the four cross-cutting sectors — health, gender, and climate.[2] This underscores the United States' recognition of the importance of water security as an essential foundation for delivering sustainable, resilient infrastructure. Through this Action Plan, the United States will build on these principles and incorporate water security and resilience into environmental and climate standards across infrastructure projects and other international engagements;
- **G20:** Water is essential to several G20 working groups, including women's empowerment, agriculture, education, environment and climate, and development. Indonesia, which holds this year's G20 presidency, has identified global health architecture and the sustainable energy transition as two of its three priorities. Building on other aspects of this Action Plan, U.S. engagement in the G20 will underscore the ways that these priorities depend on water, building toward collective action on water security as an element of the G20's workplan; and
- **UN:** The Administration's plan to deliver safe drinking water to U.S. households and remove and replace lead pipes is a key domestic action that emphasizes the critical role of sustainable water systems and the transformational power water access has in the life of each person on earth. Looking ahead to the UN Water Action Decade Midterm Conference in 2023, the United States will build on this and other domestic successes to advance and support similar progress overseas, in addition to advancing water priorities related to climate resilience, equity, and data use through the many UN agencies.

[2] The fourth sector is digital; while water is not specifically mentioned as an element of this sector, there are also significant opportunities to engage to leverage digital technology to improve water security.

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Appendix: Regional Water Security Snapshots

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EAST ASIA AND THE PACIFIC: This region's dynamic, monsoon-driven rivers support ecosystem productivity and economic activity, providing water and food security and livelihoods for millions. Countries in the region have historically relied on the dependable natural flows of some of the world's great rivers located in the region. Yet, recent impoundments on these systems and ongoing changes in climate are requiring adaptation to new water challenges.

Climate and water resource management: Changes in climate across the region are resulting in increased frequency of floods, droughts, and uncertainty regarding water availability. Sufficient and reliable water supplies for agriculture, industry, energy, fisheries, and ecosystems are no longer dependable, which threatens food and energy security, human health, the regional economy, and biodiversity. Estimates suggest over 2.5 million people were evacuated in 2020 during floods in the People's Republic of China (PRC), with an additional 63 million impacted during this time. In Malaysia, December 2021 floods forced the evacuation of over 60 thousand people.

WASH and infrastructure: Access to WASH services and facilities varies among countries in the region, with residents in urban areas generally having greater access to WASH compared to rural residents. Over the last decade, access to WASH increased in nearly all countries in the region, suggesting general water security improvements. Nevertheless, extreme flood events can present acute challenges by facilitating transmission of zoonoses and vector-borne diseases, respiratory infections, and gastrointestinal disease. As climate-induced flood events are projected to increase, these acute challenges may occur more frequently, stressing healthcare infrastructure systems and decreasing economic stability.

Governance, institutions, and political dynamics: Regional water security is affected by poorly coordinated dam operations on major river systems. A governance approach that prioritizes basin-wide and transboundary coordination is critical to maintaining water security. The PRC has upstream control over all major rivers flowing from the Tibetan plateau, which provide water shared by billions of people, creating challenges for neighboring countries. An example of the complexities of water security governance is presented by the Mekong River, which passes through multiple countries — with Laos deriving hydropower, Cambodia dependent on its freshwater fisheries, and Vietnam using resources provided at the delta. These examples represent potential sources of tension, particularly as the climate changes and water availability becomes less predictable, but also present opportunities for novel forms of cooperation, especially among the countries of Southeast Asia.

Regional key issues: The region's water resources are increasingly impacted by infrastructure development and climate change, potentially resulting in intense drought and flood events; limited access to WASH; and conflict over transboundary water resources. These issues can contribute to political and economic disputes over increasingly unreliable water resources, thus jeopardizing water, food, and energy infrastructure systems and security. Downstream states and localized riparian communities are often the most negatively affected by unilateral action that does not consider basin-wide transboundary consequences. To address these challenges, regional mechanisms such as the Mekong-U.S. Partnership and Friends of the Mekong group prioritize solutions-based approaches to transboundary water resources management.

EUROPE AND EURASIA: The European and Eurasian region spans a diversity of ecosystems and geographies and has historically been considered water secure. Ongoing changes in climate and land use, however, are increasing water stress across the entire region resulting in impacts to agricultural production and water quality. The region's access to WASH facilities is relatively good compared to other regions, although safe water and sanitation are deficient in certain areas.

Climate and water resource management: Drought conditions have recently intensified in various countries, impacting agricultural production across the region. Limited access to food due to decreased agricultural output can become a national security issue, primarily because social and political instability increases as access to food decreases. Research highlighted by the World Economic Forum suggests increased drought conditions are expected to continue, with projected hot spots in France, the Alps, the Mediterranean, and the Iberian Peninsula. On the other side of the spectrum, extreme precipitation events associated with climate change have led to intense flooding in northern, western, and central Europe, most recently in 2021. Agricultural activities also increase inputs of sediment, nutrients, and pollution that degrade freshwater ecosystems. Increased urbanization also exacerbates flooding events, as concrete and asphalt do not readily absorb rainwater and runoff.

WASH and infrastructure: Access to safe WASH services and facilities varies across the region. Approximately 48 million people in Europe lack piped water in their homes, and 31 million people do not have access to basic sanitation, according to 2019 data from the WHO. The WHO also estimates 14 people die each day in Europe due to disease associated with poor water, sanitation, and hygiene. In Russia, a limited portion of the population lacks access to a centralized water supply, and many drinking water reserves in Russia are presumed to not meet sanitary standards. A lack of access to safe water across the region can create localized political and social instability, particularly increased protest activity by environmental civil society organizations.

Governance, institutions, and political dynamics: Europe is one of the best-coordinated regions on water. The European Union (EU) Water Framework Directive requires Member States to achieve good status in all bodies of surface water and groundwater by 2027. This is the main legislative product protecting European waters and covers over 146,500 surface waterbodies and 15,000 groundwater bodies. Additionally, the EU Water Initiative focuses on regional cooperation and coordination on shared water bodies. Europe is commonly known as a hub for global multilateral organizations, and this is true for water issues as well. For example, the UN Economic Commission for Europe is the custodian for the UN Watercourses Convention, and the Organization for Economic Cooperation and Development focuses on policy, growth, and economic instruments.

Regional key issues: Regional water resources are highly interconnected, with transboundary river basins and catchment areas shared among various countries. Experts assess, however, that basin treaties inadequately address transboundary water quantity management and allocation questions, potentially contributing to tensions over use of shared rivers, lakes, and aquifers. Countries have intentionally interrupted downstream water flow in the region. In the Western Balkans, subsidies for renewable energy projects have led to the rapid and often haphazard development of mini-hydroelectric power plants (MHEPs), often by government-affiliated oligarchs and sometimes for development of MHEPs in environmentally protected areas without appropriate oversight of their environmental impact.

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MIDDLE EAST AND NORTH AFRICA: The Middle East and North Africa region is the most water-stressed in the world. Population growth, economic growth, and unsustainable water management are forecasted to reduce per capita water availability is to critical levels in the coming decades. Recent changes in climate and a high number of dams have also intensified regional water insecurity. These water issues have led to developing of the highest concentration of desalination facilities in the world, which will mitigate — but not fully alleviate — regional water stress.

Climate and water resource management: Sea level rise and coastal subsidence have increased saltwater intrusion into aquifers and estuaries throughout the region, decreasing freshwater availability. Since 2000, the region has experienced its most severe dry spell in at least 900 years; this has prompted the development of desalination infrastructure, which is costly, energy-intensive, and can have negative environmental effects including pollution and damage to marine environments. In some countries, plentiful fossil fuels make desalination an easy option, but this is not an option everywhere, nor is it sustainable. Additionally, desalination infrastructure may serve as a source of either cooperation or conflict in the region as countries leverage their access to coastal marine water resources for economic growth and political stability. The Middle East Desalination Research Center, an excellent example of cooperation in the region, is an international organization headquartered in Oman and established in 1996 as part of the Middle East Peace Process to find solutions to freshwater scarcity and conduct research, training, development cooperation, and transboundary water projects.

WASH and infrastructure: Access to WASH services and facilities is limited across most of the region. A majority of countries in the region failed to reach the sanitation and drinking water UN Millennium Development Goals — a pattern that continues based on Sustainable Development Goal statistics from the UN. Rural communities are twice as likely to lack access to WASH as urban communities. WASH systems in regions with protracted conflicts, most already operating under difficult conditions, have been further weakened by population displacement, economic disruption, and infrastructure damage.

Governance, institutions, and political dynamics: Water scarcity impacts social and economic development for most countries, and governments recognize the need to improve resource management and emphasize integrated water resources management, rather than focus solely on service provision and supply augmentation. However, water management efforts have been aggravated by increased water demand as well as resource pollution due to urbanization, industrialization, and population growth. Water pollution, in part due to insufficient wastewater treatment, also has an impact on public health. According to the World Bank, up to 85 percent of water resources in the region are used for agriculture, which represents a small share of regional GDP but is an important to livelihoods in poor rural areas. Given differing levels of economic development across the region, national ability to effectively manage water resources varies widely.

Regional key issues: The region has a greater proportion of available water reserved in storage than any other region in the world. The region's numerous dams facilitate domestic water management but have severe transboundary consequences for neighboring countries. Drought has led to water crises in the region, and hydropower development has had lasting impacts on flows of freshwater downstream, particularly in the Tigris-Euphrates basin. Transboundary water agreements surrounding the Jordan River — shared by Syria, Jordan, and Israel — have provided one framework for managing this shared resource even with numerous dams along the river.

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SOUTH AND CENTRAL ASIA: This region houses almost 25 percent of the global population but represents only about 8.5 percent of the planet's total land area. Most countries in the region are water-stressed, which hinders agricultural production, energy, and access to clean water and sanitation. Climate change is warming the region at a relatively rapid rate and aggravating water insecurity.

Climate and water resource management: The World Resources Institute rates water stress in the South and Central Asian region as "high to extremely high," and predicts that by 2040, Afghanistan, Kyrgyzstan, Kazakhstan, Pakistan, Turkmenistan, and Uzbekistan will be among the most water-stressed countries in the world. Climate change is already impacting the region, with rising temperature, reduced precipitation, and retreating glaciers further stressing water supplies. Recent increase in air temperatures and decrease in rain and snow at higher elevations in Afghanistan, Pakistan, and Central Asia have led to severe and prolonged droughts, resulting in loss of livestock, reduced agricultural production, and decreased groundwater — all of which threaten water supplies, food security, energy grids, and political stability and the habitability of some regions. Almost all areas in India can be regarded as water-stressed and several of its aquifers are under threat of being completely depleted in the next five years — another potentially significant source of political and social disruption. Increases in intense rainfall events associated with climate change also have increased the number of outbreaks of dengue, malaria, leptospirosis, and cholera.

WASH and infrastructure: Lack of access to safe WASH services and facilities is a significant challenge throughout the region. Much of South Asia's population lack access to soap and water for hygiene and treated drinking water, leading to a high incidence of water-borne disease. Central Asia faces similar challenges, with rural populations particularly affected by lack of access to sanitation systems. Moreover, much of Central Asia's water infrastructure was built during the Soviet era, and drinking water supply is often contaminated with toxic metals that can lead to chronic health issues.

Governance, institutions, and political dynamics: Almost all major continental river basins in the region are transboundary, and nearly all the region's major rivers are the subject of some level of contention aggravated by agriculture demands, water needs for hydroelectric power generation, and climate instability. In Central Asia, the Amu Darya and the Syr Darya are the primary river systems critical for agriculture and energy generation. However, lack of coordinated transboundary water governance in Central Asia has led to significant regional water stress and contributed to further degradation of the Aral Sea, as well as contributing to cross-border conflicts in remote regions of Tajikistan and the Kyrgyz Republic. The Indus Waters Treaty has withstood six decades and four Indo-Pakistani wars but is facing pressure due to regional population growth and disagreement over hydropower use. While water governance within India has improved over the last decade, subnational inter-state water disputes have increased.

Regional key issues: The PRC is the source of some of South Asia's most important rivers, and the PRC's planned dam construction threatens water supplies for South Asian countries downstream and creates other challenges for them. Drought conditions have exacerbated the humanitarian crisis in Afghanistan and contribute to the high levels of food insecurity throughout the country. The Taliban have exerted control over water resources in Afghanistan but have not demonstrated the technical capacity to address water security issues.

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SUB-SAHARAN AFRICA: Sub-Saharan Africa is one of the most water-stressed areas in the world, with insufficient water infrastructure and limited access to safe water and sanitation prevalent across the region. Climate change and population growth are expected to exacerbate water scarcity as national and local governments struggle to fund and manage the necessary infrastructure to meet future water-related challenges.

Climate and water resource management: The WHO estimates that one in three people lack sufficient access to water in Africa. Climate change has driven increases in air temperature and changes in precipitation causing droughts and localized flooding. Additionally, by 2050 one-fourth of the world's population will be African, requiring a more developed, integrated water resource management (IWRM) approach. According to the African Ministers' Council on Water, approximately 75 percent of African countries will not meet the global Sustainable Development Goal target of implementing IWRM before 2030, likely due to limited financing. As climate change and population growth further stress Africa's water systems, significant financial investment in water infrastructure will be needed to avert water-related crises.

WASH and infrastructure: Much of the region lacks widespread access to safe water, sanitation, and hygiene (WASH) services and facilities, and many households lack both in-house water and sanitation facilities. Limited WASH access often requires travel to water access points, resulting in close contact among groups of people, compounding sanitation issues and creating disease transmission points. Political instability, when coupled with disease outbreaks, can potentially further destabilize social and economic activities in affected regions. Securing safe WASH access for all of Sub-Saharan Africa would require capital investments of approximately $35 billion per year, according to World Bank estimates.

Governance, institutions, and political dynamics: Water policy is set at the national level in most African countries, with several countries having national water service providers. City governments also have begun developing their own water plans to increase WASH access. Sparse water-related data, however, limits monitoring and evaluation of the effectiveness of water governance. While effective water management is recognized as a necessity across the region, budget shortfalls and a lack of access to water infrastructure-related finance instruments have been major obstacles to improving water governance.

Regional key issues: Massive funding increases are needed in water sector finance and investment across the Africa region; however, weak institutions and endemic corruption have tempered private sector interest and made national and subnational governments reliant on significant international donor support in the water sector. Water stress also exacerbates regional health, migration, and food security crises, often leading to engagement by international donors, non-governmental organizations, and multilateral organizations. Moreover, many large water basins are shared between countries, raising the potential for transboundary water tensions in areas such as the Nile Basin, the Okavango Delta, Lake Victoria, and Lake Chad.

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WESTERN HEMISPHERE: Home to 30 percent of the world's freshwater resources but only 8 percent of the population, this region encompasses several of the world's great rivers and almost all types of climatic zones. However, WASH disparities in this region can be linked to increased migration, government instability, and disease spread. Climate change is not only altering water resource availability and creating seasonal stresses across the region, the increased frequency and severity of hurricanes are having devastating effects on the Caribbean and parts of Central America on an almost annual basis.

Climate and water resource management: Northern Canada is warming at a rate four times the global average, resulting in shrinking snowpack as well as melting glaciers and permafrost. These changes can affect Indigenous communities through increased flooding and droughts. Drought frequency and intensity are increasing in Mexico and Central America, largely due to changes in precipitation patterns. These droughts are severely impacting agricultural production and food security and serving as one of the instigators to migration from the region. There are also regions of Colombia, Peru, Ecuador, and Bolivia that rely on glaciers for freshwater, which continue to decrease in size. Recent drought in Brazil, Argentina, and Paraguay has impacted agricultural production. Reservoirs in southern Brazil were at a 91-year low in 2021. Over 350 hydropower dams are proposed across the Amazon; however, unreliable river flows due to climate change may increase hydropower costs, making it a less competitive energy option.

WASH and infrastructure: Access to safe WASH services vary across Central and South America, however gaps in basic sanitation contribute to inequality, drive migration, and foment civil unrest. In Chile, for example, almost everyone has access to basic sanitation, while a 2021 report from the WHO indicated that 28 percent of the rural population in Brazil lacked access to safe drinking water. In many countries, urban communities have greater access to WASH resources than their rural counterparts. As natural disasters increase in severity and frequency due to climate change, damage to infrastructure causes service interruptions, which can lead to a higher prevalence of vector-borne diseases in the region, such as dengue and malaria. Due to physical proximity outbreaks of these diseases can easily spread to the United States.

Governance, institutions, and political dynamics: Water governance is often decentralized in Central and South America. While ability to address emerging challenges varies throughout the region, there is a realization at all levels of government that climate change will decrease water availability in the near future. In addition, regional governance deficiencies often correlate to national and municipal-level gaps in policy, funding, and accountability. Increasing urbanization also poses challenges for water governance, particularly in the region's largest cities. According to the Nature Conservancy, 16 of Latin America's 20 largest cities are "water-stressed," and its three largest cities — São Paulo, Mexico City, and Lima — are at risk of running out of water, making large city centers an increasingly important focus for improved water management.

Regional key issues: Changes in climate and deforestation in the Amazon River basin have altered water availability in many areas from Canada to Argentina, with indigenous communities in particular facing challenges due to this environmental degradation. Deforestation is a primary issue affecting all aspects of the environment in the Amazon River basin, including local climate, water, and food resources.