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BUILDING RESILIENCE TO WATER SCARCITY IN SUB-SAHARAN AFRICA: THE ROLE OF FAMILY PLANNING

In 2015, almost half of the people in the world without access to improved drinking water lived in sub-Saharan Africa.

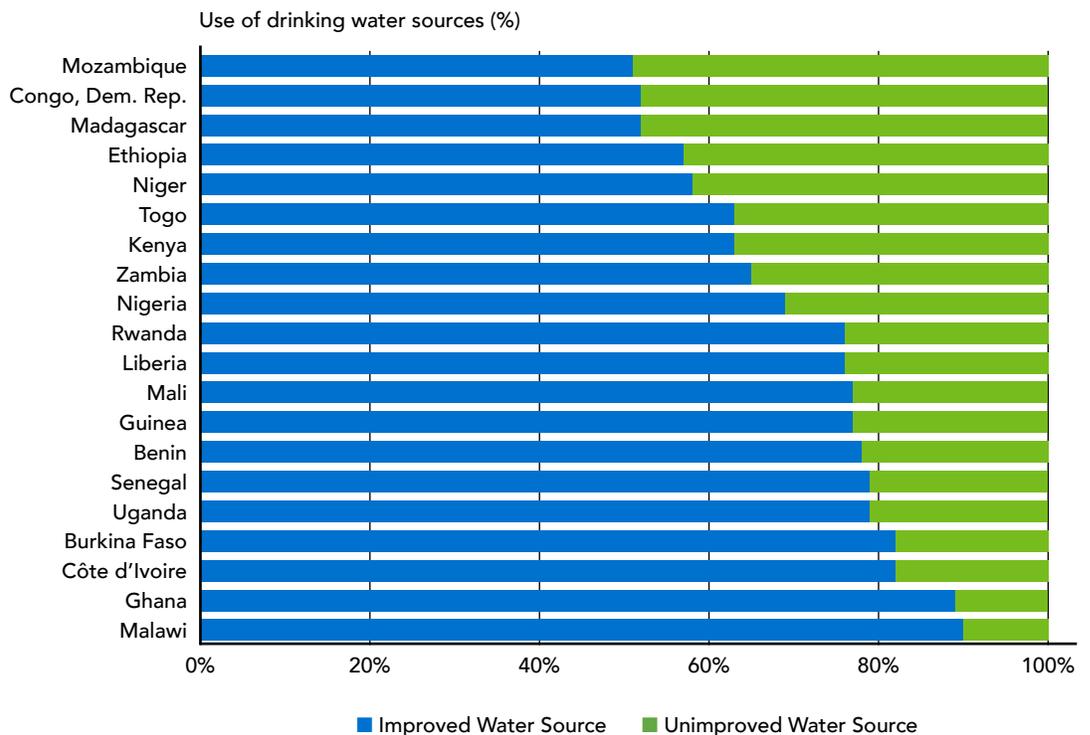
Family planning can help reduce inequities among groups of women whose access to water is inadequate, such as the poor, marginalized, and those residing in rural areas.

Regardless of geography, the poor and marginalized have less access to improved water than the wealthy.

*This policy brief is distilled from a report released in 2016 by Population Reference Bureau (PRB), entitled *Fostering Economic Growth, Equity, and Resilience in Sub-Saharan Africa: The Role of Family Planning*, by Ishrat Husain, Kaitlyn Patierno, Inday Zosa-Feranil, and Rhonda Smith.*

Despite great progress in recent years, sufficient access to improved water sources remains out of reach for more than one-third of people living in sub-Saharan Africa (SSA).¹ Although access to improved drinking water increased by 20 percent in SSA over the Millennium Development Goals (MDGs) period from 1990 to 2015, the region fell short of achieving its MDG target of 74 percent access to improved drinking water. Overall, 68 percent of SSA's population has access to improved drinking water, with great variability across countries (see Figure 1). In 2015, almost half of the people in the world without access to improved drinking water lived in SSA.²

FIGURE 1
Percent Use of Drinking Water Sources



Source: UNICEF and World Health Organization, *25 Years: Progress on Sanitation and Drinking Water, 2015 Update and MDG Assessment*.

Population growth places additional stress on existing sources of improved water and water infrastructure. Family planning can mitigate water scarcity by promoting fertility decline and reducing population pressures on water resources. Avoiding unintended pregnancies and spacing births also allows women and men to spend time and energy building more resilient households in the face of water scarcity.

Sub-Saharan Africa Faces High Dependency on Groundwater and Underground Aquifers

In regions facing water scarcity, climate change is a contributing factor, but water scarcity is worsened by the high dependency on groundwater from rivers and underground aquifers for irrigation. Aquifers are pools of water contained in rock layers and soil beneath the earth's surface. A 2015 study confirmed that eight aquifers in Africa experienced little to no refilling to offset water withdrawals between 2003 and 2013 (see Figure 2).³

Globally, the lack of groundwater is already causing significant ecological damage, including declining water quality, depleted rivers, and receding land—all of which will likely be intensified by population growth and climate change.⁴ At least one in five people still rely on surface water in Angola, Kenya, Madagascar, Sierra Leone, and South Sudan.⁵ Although the proportion of the population using rivers, lakes, ponds, and irrigation canals as their primary source of

drinking water has more than halved since 1990, large urban populations are already overdrawing from rivers.⁶ For example, the Bright Drainages river basin of Nigeria, Benin, and Togo is expected to face an extensive water shortage by 2050, affecting 92 million people.⁷ Including voluntary family planning in a multisectoral approach to managing groundwater resources will further reduce withdrawal and help preserve groundwater sources for future generations.

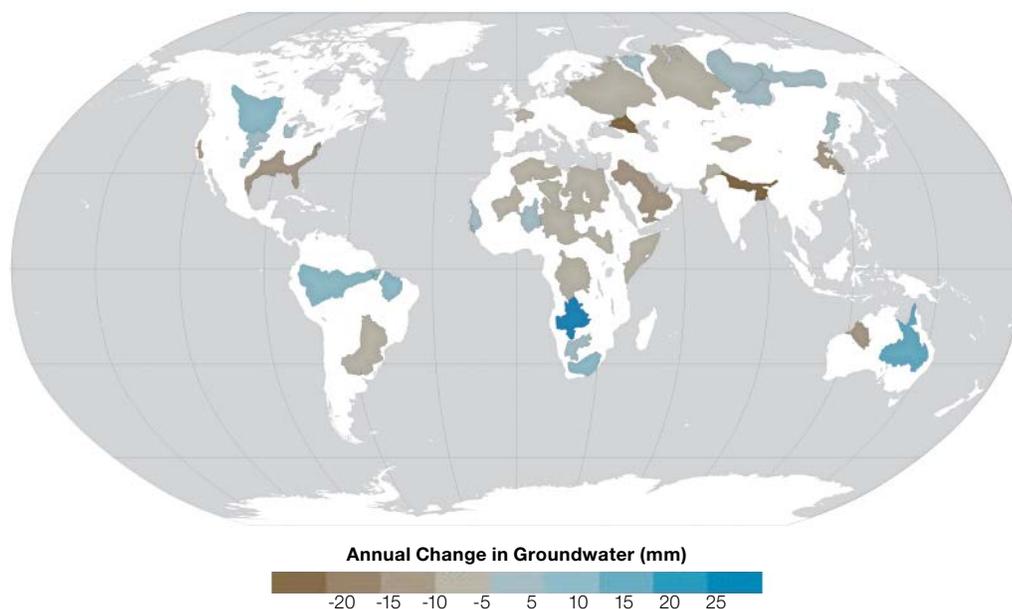
Climate Change Exacerbates Water Stress

The 2014 Fifth Assessment Report of the Intergovernmental Panel on Climate Change noted that there is a high confidence that climate change will amplify existing stress on water availability in Africa. Changing climate precipitation and temperature norms coupled with existing water scarcity threaten agricultural productivity.⁸

Climate change can also affect water quality. For example, flooding can contaminate groundwater through boreholes and unprotected wells. As a result of long-term rainfall increase in some areas, groundwater levels may rise, decreasing the efficiency of natural purification processes and increasing risks of infectious diseases and exposure to toxic chemicals.⁹

Across SSA, climate change is already having short- and long-term effects on marine, freshwater, and terrestrial ecosystems, with links to food production, livestock, livelihoods, health, floods, and droughts.¹⁰ Policies that promote family

FIGURE 2
Change in Groundwater Storage in the World's Largest Aquifer Systems, 2003-2013



Source: NASA Earth Observatory 2015, "Global Groundwater Basins in Distress."

planning can improve health and economic well-being, helping families build resilience to climate change by reducing the vulnerabilities that people face in the rise of environmental shocks and stresses.

Rapid Urban Growth Taxes Water Infrastructure

SSA’s urban population has grown twice as fast—4 percent annually—in recent years than the global average.¹¹ Urban growth exacerbates the challenge of water scarcity by further straining already limited water sources, especially in dry regions such as the Sahel.¹² Population growth is a major driving force in urbanization in SSA and its associated demands on water and other natural resources.

Poor and aging water infrastructure and poor waste management have not kept up with increasing demand for water in urban areas, frequently resulting in insufficient water supply in SSA’s largest cities. As economies have grown, industrial waste, agro-chemicals, and oil have irreversibly contaminated some water reserves in SSA.¹³ Agriculture or grazing on land near or outside of cities can send sediments and pollutants into groundwater sources.¹⁴ Contamination of drinking water sources results in the spread of water-borne diseases.¹⁵ Poor water quality reduces the overall available supply, increases water treatment costs, and diminishes the lifespan of existing water infrastructure.¹⁶

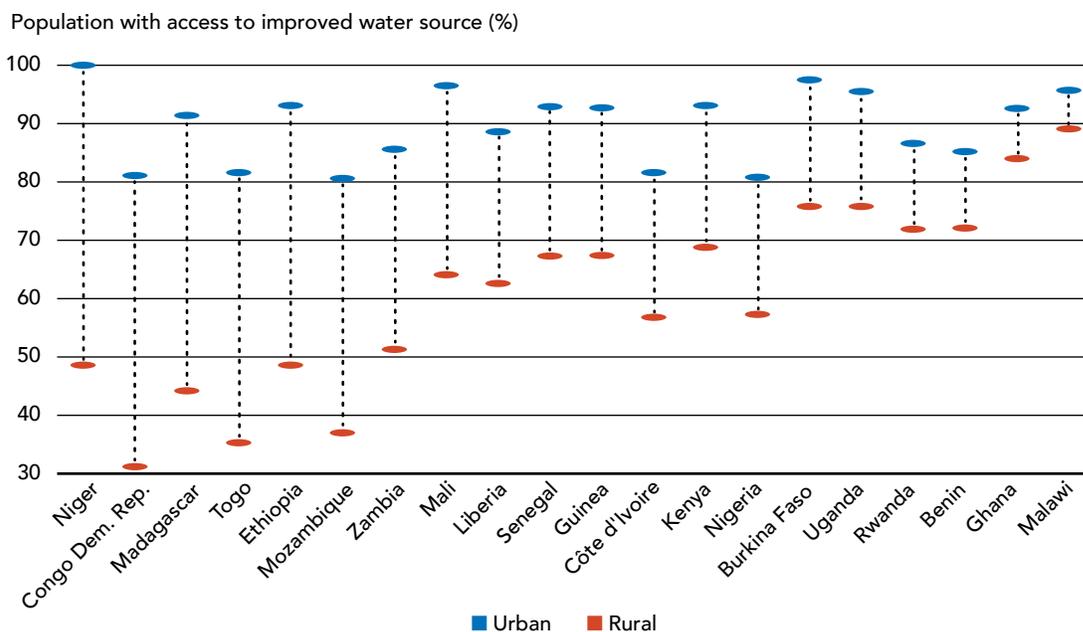
Rural Residents Have Inequitable Access to Water

Globally, large disparities exist between rural and urban access to improved water sources. In SSA, gaps between urban and rural coverage vary widely from country to country (see Figure 3). For example, the difference between the percentage of urban and rural residents with access to improved water in Niger is 51 percent compared to 6 percent in Malawi.¹⁷

Regardless of geography, the poor and marginalized have less access to improved water than the wealthy. In 2012, half of countries tracked had a difference of at least 10 percentage points in access to water between the poorest and richest urban wealth quintiles.¹⁸ High fertility can contribute to a cycle of poverty for generations; lower fertility among the wealthy creates greater opportunity for investments in family needs as well as savings and capital accumulation. Family planning, through its role in reducing fertility, plays a crucial role in reducing inequities, improving economic opportunities for the poor, and building resilience to environmental shocks and stressors, including water scarcity.

Women are disproportionately affected by water scarcity since they are often responsible for fetching water for their household.¹⁹ Changes in water availability due to drought or erratic rainfall from climate change will increase the workload

FIGURE 3
Percent Population With Access to Improved Water Source



Source: UNICEF and World Health Organization, 25 Years: Progress on Sanitation and Drinking Water, 2015 Update and MDG Assessment.

of women and girls because they must walk longer distances and spend more time securing water. Additional time spent on resource collection means less time available for education, income generation, or household food production.²⁰ Women who are able to plan the timing and number of children they desire have more time and resources to achieve their educational goals and invest in their families. Therefore, voluntary family planning can help reduce vulnerabilities among women and empower them to build resilient households in the face of water scarcity.

Recommended Actions

Improve management of water resources, particularly in urban areas, in the context of population growth.

Increasing institutional capacity to manage existing water resources and to plan for water and sanitation infrastructure is crucial.²¹ Investing in research and testing of a broad variety of alternative urban water and sanitation solutions for cost-effectiveness, applicability, and acceptability can accelerate the achievement of increased access.²² Efforts to increase overall coverage of improved drinking water should also focus on reducing the gap in access between wealth quintiles.²³

Projections indicate that African cities will increasingly need to invest in short-scale water transport infrastructure to satisfy the needs of growing urban populations.²⁴ Investments in water transport can successfully reduce potential water stress, but can be costly depending on proximity of water resources, making effective management of nearby water resources for quantity and quality essential.²⁵ Locally developed and managed schemes that regulate extractions and recharge of groundwater and multinational cooperative governance of aquifers to manage pollution and depletion can be successful.²⁶

In agriculture, families can build resilience by engaging in new agricultural techniques and new sources of sustenance and livelihoods, including migrating to urban areas and testing new crop varieties.²⁷ Innovative farming practices that reduce sedimentation while also benefiting farm productivity can help address water quality.²⁸ Adaptive land and water management strategies are needed that combine short-term strategies for climate variability—for example, periodic floods and droughts—and long-term strategies for climate change—for example, an increase in the frequency of floods and droughts over time.²⁹

Increase access to family planning to empower women and other groups who face inequities in water access.

Voluntary family planning services allow women to determine the number and timing of children that they desire and results in safer pregnancy and healthier children. With fewer children to care for, women have more time and energy to improve their education and join the labor force. They can also more readily participate in the livelihood changes needed to adapt to climate change and increase household resilience to environmental stressors and water scarcity.³⁰ Family planning can also help reduce inequities among groups of women whose access to water is inadequate, such as the poor, marginalized, and those residing in rural areas.

Voluntary family planning helps slow the pace of population growth and relieves pressures on water availability. Helping women in SSA achieve their own aspirations for planning pregnancies and family size would contribute to slower population growth, reduce rapid urban growth, and, consequently, ease water scarcity.

References

- 1 An “improved drinking water source” is one that is free from contamination, especially fecal matter, due to proper use and delivery. “Water scarcity” includes scarcity in availability of fresh water of acceptable quality, scarcity in access to water services, and scarcity due to lack of adequate infrastructure, irrespective of the level of water resources, according to WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, “Improved and Unimproved Water Sources and Sanitation Facilities,” accessed at <https://washdata.org/monitoring/drinking-water>, on Jul. 18, 2017 and FAO, “Water Scarcity,” accessed at www.fao.org/nr/water/topics_scarcity.html, on Aug. 9, 2016; Climat Environnement Société, “Water Scarcity in Africa: Issues and Challenges,” accessed at www.climat.fr/en/node/1417, on June 23, 2016.
- 2 UNICEF and World Health Organization (WHO), *Progress on Sanitation and Drinking Water—2015 Update and MDG Assessment* (New York: UNICEF and WHO, 2015).
- 3 NASA, Jet Propulsion Laboratory, California Institute of Technology, “Study: Third of Big Groundwater Basins in Distress,” (June 16, 2015), accessed at www.jpl.nasa.gov/news/news.php?feature=4626, on June 23, 2016.
- 4 Alexandra Richey et al., “Quantifying Renewable Groundwater Stress With GRACE,” *Water Resources Research* 51, no. 7 (2015): 5217-38.
- 5 UNICEF and WHO, *Safely Managed Drinking Water-Thematic Report on Drinking Water 2017* (New York: UNICEF and WHO, 2017).
- 6 UNICEF and WHO, *Progress on Sanitation and Drinking Water*.
- 7 Robert I. McDonald et al., “Urban Growth, Climate Change, and Freshwater Availability,” *PNAS* 108, no. 15 (2011): 6312-17.

- 8 I. Niang et al., "Africa," in *Climate Change 2014: Impacts, Adaptation, and Vulnerability, Part B: Regional Aspects*, ed. V.R. Barros et al. (Cambridge, UK, and New York: Cambridge University Press, 2014).
- 9 Niang et al., "Africa."
- 10 Intergovernmental Panel on Climate Change (IPCC), "Summary for Policymakers," in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. T.F. Stocker et al. (Cambridge, UK, and New York: Cambridge University Press, 2013).
- 11 United Nations (UN), *World Urbanization Prospects: The 2014 Revision* (New York: UN, 2014).
- 12 McDonald et al., "Urban Growth, Climate Change, and Freshwater Availability."
- 13 Any Freitas, *Water as a Stress Factor in Sub-Saharan Africa* (European Union Institute for Security Studies, 2013).
- 14 The Nature Conservancy, *Sub-Saharan Africa's Urban Water Blueprint* (Nairobi: The Nature Conservancy, 2016).
- 15 Jean-Christophe Fotso et al., "Progress Towards the Child Mortality Millennium Development Goal in Urban Sub-Saharan Africa: The Dynamics of Population Growth, Immunization, and Access to Clean Water," *BMC Public Health* 7, no. 218 (2007).
- 16 The Nature Conservancy, *Sub-Saharan Africa's Urban Water Blueprint*.
- 17 WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, "Data & Estimates Tables," accessed at www.wssinfo.org/data-estimates/tables/, on May 15, 2017.
- 18 UNICEF and WHO, *Safely Managed Drinking Water*.
- 19 WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, *Progress on Sanitation and Drinking Water—2010 Update* (Geneva: WHO and UNICEF, 2010).
- 20 Mercy Corps, "Rethinking Resilience: Prioritizing Gender Integration," undated, accessed at www.mercycorps.org/sites/default/files/Mercy%20Corps%20Gender%20and%20Resilience%20September%202014.pdf, on June 23, 2016.
- 21 I. Niang et al., "Africa."
- 22 Tove A. Larsen et al., "Emerging Solutions to the Water Challenges of an Urbanizing World," *Science* 352, no. 6288 (2016).
- 23 UNICEF and WHO, *Progress on Sanitation and Drinking Water*.
- 24 McDonald et al., "Urban Growth, Climate Change, and Freshwater Availability."
- 25 The Nature Conservancy, *Sub-Saharan Africa's Urban Water Blueprint*.
- 26 Henry Vaux, "Groundwater Under Stress: The Importance of Management," *Environmental Earth Science* 62, no. 1 (2011):19-23; David O'Flynn, "Water Issues and Solutions: In a World Experiencing Urbanization, Unprecedented Population Growth, and Struggling to Deal with Climate Change," *World Future Review* 6, no. 4 (2015): 390-97.
- 27 I. Niang et al., "Africa."
- 28 The Nature Conservancy, *Sub-Saharan Africa's Urban Water Blueprint*.
- 29 Pierre Mukheibir, "Water Access, Water Scarcity, and Climate Change," *Environmental Management* 45 (2010): 1027–39.
- 30 Jason Bremner et al., *Building Resilience Through Family Planning: A Transformative Approach for Women, Families, and Communities* (Washington, DC: Population Reference Bureau, 2015).



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