**Looking at Water Insecurity Through a Psychological Lens**

Laura López-Aybar[[1]](#footnote-1) & Omar Pérez-Figueroa[[2]](#footnote-2)

In 2010, the United Nations (UN) declared access to water and sanitation as a fundamental human right[[3]](#footnote-3). Lack of access to water and sanitation impacts the world in different ways, including but not limited to, health and the distribution of resources. Furthermore, it has implications at the individual, communal and institutional levels. At the individual level, it can exacerbate racial, age, socioeconomic and gender disparities. On the communal level, communities can be impacted when marginalized and denied essential services by the state[[4]](#footnote-4). While research shows that water insecurity disproportionately impacts the global south, climate change's impending threat has shown us that this is a global phenomenon[[5]](#footnote-5).

To address water insecurity, we need to consider psychological and behavioral science as essential contributors to understanding this global phenomenon. Psychological knowledge can help us understand the emotions, behaviors, and motivations behind different considerations surrounding water insecurity and climate change. Additionally, it helps us understand the psychological "spill-over" effect of not having effective strategies to address the impact of water insecurity and climate change. In this response to the call for input, we will focus on the adverse psychological effects and ramifications of water insecurity on women, children, families, and persons of color. Additionally, we will focus on the role of power on resource distribution in exacerbating water insecurity. By reviewing and combining global research, we aim to offer a succinct but cohesive research review that answers questions 1 and 2. Additionally, we will address interdisciplinary factors contributing to water insecurity, including how they intersect. Finally, we will provide policy recommendations based on this scholarly review. We will address these areas as they relate to SDG subgoals 6.1 and 6.2.

**Psychosocial Disparities of Water Insecurity and Climate Change**

Extensive evidence argues that mental and physical health are intertwined with persistent water insecurity. Extreme weather events, such as floods and hurricanes, can create situations where water insecurity is present, leading to emotional distress and impacting overall well-being[[6]](#footnote-6). For example, individuals who experience droughts and floods endorse increased psychological distress, characterized by post-traumatic stress disorder (PTSD) symptoms, depression, and anxiety[[7]](#footnote-7),[[8]](#footnote-8). When these symptoms are not addressed, they may become persistent and more damaging to both the individual and their communities[[9]](#footnote-9).

Violence resulting from water insecurity and adverse weather events has a disproportionate impact on women, children, and persons of color. For instance, as a result of Hurricane Maria, women in some rural communities in Puerto Rico shouldered extraordinary physical, financial, and emotional burdens[[10]](#footnote-10). It is estimated that in Sub-Saharan Africa, people spend around 40 billion hours a year carrying water, mostly women[[11]](#footnote-11). According to the World Health Organization (WHO), in communities where there is water insecurity, four in five women are responsible for collecting water[[12]](#footnote-12). The physical toll this work has on women is immense—they report spinal injury, neck, abdomen, and back pain, breathlessness, falling, fatigue, caloric expenditure, attacks by animals and even death by drowning[[13]](#footnote-13). On top of the physical effects, anxiety, worry, anger, shame, rumination, bother, and fear are common psychological symptoms related to water insecurity13,[[14]](#footnote-14) . Additionally, access to water and water-related infrastructure, such as sanitation, can be a matter of life and death for pregnant women and their fetuses[[15]](#footnote-15). Preterm birth and low infant birth weight have been directly related to the stress and physical toll of experiencing water insecurity.

Women experiencing water insecurity are more likely to experience gender-based violence and other types of attacks by non-partners. Pregnant women who report experiencing gender-based and other types of violence related to water insecurity have higher odds of having preterm birth and low infant birth weight[[16]](#footnote-16).  Furthermore, gender-based violence experiences increase the likelihood of depression, PTSD, substance misuse, chronic pain, sexually transmitted diseases, and other persistent psychiatric and physical symptoms[[17]](#footnote-17),[[18]](#footnote-18). Violence related to water insecurity does not only affect adult women, but it affects girls as well. Water insecurity causes girls to experience deprivations in terms of education, free time, privacy, and social mobility. Similarly to their mothers, girls are at risk of experiencing harassment and assault[[19]](#footnote-19) while getting water. Compromised hygiene and sanitation were other ways families were impacted, specifically infants, girls, and women20. Additionally, both women and girls are at risk of developing continuous urinary tract infections as a result of compromised sanitation and hygiene[[20]](#footnote-20). Girls whose mothers are experiencing psychological symptoms such as depression related to water insecurity miss school more often[[21]](#footnote-21). Further, missing school days may be an indicator of water insecurity for most children and infants, as a result of searching for water, resulting in skin infections, rashes, or overall compromised sanitation20.

While having a lower socioeconomic status (SES) can result in water insecurity disparities, there is evidence that race, age, and gender are contributing factors too. For example, in post-apartheid South Africa, persons of color were often experiencing the consequences of water insecurity, specifically women and girls who were tasked primarily with household work. Furthermore, girls of color are more likely to drop out of schools because of limited access to sanitation[[22]](#footnote-22). In the United States, communities of lower SES, predominantly Non-Hispanic, Black and Hispanic communities are more exposed to lead, inadequate hydration and municipal water service exclusion[[23]](#footnote-23), [[24]](#footnote-24), [[25]](#footnote-25). Additionally, individuals experiencing water insecurity endorse higher discrimination and marginalization rates[[26]](#footnote-26). As a result, racial discrimination experiences have short- and long-term psychological effects such as fear, victimization, perceptions of threat, low self-efficacy, low self-esteem, and hopelessness. If cumulative experiences of perceived discrimination occur, it can lead to anxiety, anger, depression, and trauma[[27]](#footnote-27), impacting the individual negatively.

Lack of water and sanitation infrastructure has complex effects on consumption patterns, increasing water insecurities. These effects exert a significant influence on the general well-being of people. The urban and rural poor not only have low incomes but, compared to higher-income families, face higher water costs, especially since water is an essential product that must be consumed daily and for which there is no substitute. The lack of connections to the water network, in the case of the poor urban sectors, or any water service in the case of the poor rural sectors, forces them to buy water from a supplier at very high prices[[28]](#footnote-28), stand in long lines, or walk long distances to reach public fountains, and incur additional costs to store and boil water. The time spent collecting water can impede lower SES individuals from focusing on other income-generating tasks or spending meaningful time with their families20. Children of families who are contextually deprived (e.g., income) are at higher risk of experiencing difficulty related to emotional regulation[[29]](#footnote-29) and low levels of parental warmth related to the lack of connectedness between family members[[30]](#footnote-30), affecting family dynamics relationships. When provided with accessible water, familiar relationships have been shown to improve by allowing them time to focus on problem-solving around other issues such as finances and other individual functioning[[31]](#footnote-31).

Water insecurity and adverse weather events often force families into migrating from their homes[[32]](#footnote-32). As a result, forced migration leads to psychological complications for families, who often experience increased trauma. This trauma is exacerbated by high-stress levels, as characterized by experiences of discrimination, language barriers, isolation, and overall acculturation[[33]](#footnote-33). Moreover, immigrants are at higher risk of experiencing homelessness and gender-based violence[[34]](#footnote-34). Forced separation from places and families of origin has long-term psychological and psychosocial effects on families, such as fear, anxiety, anger, crying, poor vocational performance, and housing instability. Overall, forced migration related to water insecurity and adverse weather events may result in low quality of life and low psychological well-being[[35]](#footnote-35). Water insecurity, adverse weather events, and migration increase the likelihood of violence occurring, specifically gender-based violence. These violent conduct can be passed down from generation to generation through a process known as intergenerational transmission of gender-based violence. If not stopped or addressed, when children who have experienced and witnessed violence become adults, they are at higher risk of being both victims and perpetrators of violence[[36]](#footnote-36).

The current COVID-19 pandemic, has further exposed the unequal and disparate impacts of water insecurity and climate change. While COVID-19 cases continue to surge in the U.S[[37]](#footnote-37) and the world,[[38]](#footnote-38) extreme weather events are heightening the negative consequences of the pandemic[[39]](#footnote-39). One way of combating this pandemic has been by washing our hands regularly, upholding the importance of water accesibility[[40]](#footnote-40). Nevertheless, this may not be possible in all countries. The combination of lacking access to clean drinking water and the aftermath of extreme weather events, such as droughts, floods and storms, create circumstances in which access to water is limited, putting human lives at risk. For example, recent droughts in the U.S and the Caribbean, as well as intense storms, are compromising and creating difficulty related to the basic requirements for combating the pandemic[[41]](#footnote-41),[[42]](#footnote-42). Water insecurity during these events further highlights inequalities, hardships, and global health risks that result from the collective failure to comply and enforce the human right to water and sanitation[[43]](#footnote-43). Human beings deserve the opportunity to live a dignified life. Institutions and governments hold the key to preventing the direct and indirect impacts both water insecurity and climate change have on the quality of human life.

**Policy Recommendations**

1.   The UN Member States should promote and ensure women's participation in government and other national and local decision-making bodies and processes, including those related to the management of human rights to water.

2.   Governments at the national, sub-national, and local levels need to generate, implement, and monitor institutional policies and educational curricula to ensure sustainable water access and security.

3.   Member States of the UN and other stakeholders should include eliminating water insecurity disparities related to race and ethnicity in SDG Goal 6.

4.   Design and craft policies aimed to address social inequalities, such as increasing access to high-quality education schools, increase taxes on the higher SES brackets, childcare subsidies, among other—to the extent that countries can implement and support them

5.   Member States should secure funding to ensure access to secure and sustainable water.

1. Clinical Psychology, Adelphi University [↑](#footnote-ref-1)
2. Environmental and Urban Planning and Policy, University of California, Irvine [↑](#footnote-ref-2)
3. Assembly, U. G. (2010). Resolution 64/292: The human right to water and sanitation. 64th Session. [↑](#footnote-ref-3)
4. Ranganathan, M., & Balazs, C. (2015). Water marginalization at the urban fringe: environmental justice and urban political ecology across the North–South divide. *Urban Geography*, *36*(3), 403-423. [↑](#footnote-ref-4)
5. Mitlin, D., Beard, V. A., Satterthwaite, D., & Du, J. (2019). Unaffordable and undrinkable: Rethinking urban water access in the global south. [↑](#footnote-ref-5)
6. Rosinger, A. Y. (2018). Household water insecurity after a historic flood: Diarrhea and dehydration in the Bolivian Amazon. *Social Science &*

*Medicine, 197*, 192–202. [↑](#footnote-ref-6)
7. Munro, A., Kovats, R. S., Rubin, G. J., Waite, T. D., Bone, A., Armstrong, B.,  Oliver, I., & The English National Study of Flooding and Health Study Group  (2017). Effect of evacuation and displacement on the association between flooding and mental health outcomes: a cross-sectional analysis of UK survey data. *The Lancet Planetary Health*, *1*(4), e134-e141. [↑](#footnote-ref-7)
8. O’Brien, L. V., Berry, H. L., Coleman, C., & Hanigan, I. C. (2014). Drought as a mental health exposure. *Environmental Research*, *131*, 181-187. [↑](#footnote-ref-8)
9. Schwartz, R. M., Gillezeau, C. N., Liu, B., Lieberman-Cribbin, W., & Taioli, E. (2017). Longitudinal impact of Hurricane Sandy exposure on mental health symptoms. *International journal of environmental research and public health*, *14*(9), 957. [↑](#footnote-ref-9)
10. Oxfam. (2018) The Weight of Water on Women: The Long Wake of Hurricane Maria on Puerto Rico. [↑](#footnote-ref-10)
11. Ray, I. (2007). Women, water, and development. *Annu. Rev. Environ.* *Resour., 32*, 421-449. [↑](#footnote-ref-11)
12. World Health Organization. (2017). Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines. [↑](#footnote-ref-12)
13. Collins, S. M., Mbullo Owuor, P., Miller, J. D., Boateng, G. O., Wekesa, P., Onono, M., & Young, S. L. (2019). ‘I know how stressful it is to lack water!’Exploring the lived experiences of household water insecurity among pregnant and postpartum women in western Kenya. *Global Public Health, 14*(5), 649-662. [↑](#footnote-ref-13)
14. Wutich, A., & Ragsdale, K. (2008). Water insecurity and emotional distress: coping with supply, access, and seasonal variability of water in a Bolivian squatter settlement. *Social science & medicine, 67*(12), 2116-2125. [↑](#footnote-ref-14)
15. Mishra, V. K. (2015). Social and psychological impact of limited access to sanitation: MHM and reproductive tract infections. IN: Shaw, RJ (ed). [↑](#footnote-ref-15)
16. Baker, K. K., Story, W. T., Walser-Kuntz, E., & Zimmerman, M. B. (2018). Impact of social capital, harassment of women and girls, and water and sanitation access on premature birth and low infant birth weight in India. *PloS one, 13*(10), e0205345. [↑](#footnote-ref-16)
17. Coker, A. L., Davis, K. E., Arias, I., Desai, S., Sanderson, M., Brandt, H. M., & Smith, P. H. (2002). Physical and mental health effects of

intimate partner violence for men and women. *American Journal of Preventive Medicine,* *23*(4), 260–268. [↑](#footnote-ref-17)
18. Okuda, M., Olfson, M., Hasin, D., Grant, B. F., Lin, K. H., & Blanco, C. (2011). Mental health of victims of intimate partner violence: Results

from a national epidemiologic survey. *Psychiatric Services, 62*(8), 959–962. [↑](#footnote-ref-18)
19. Nallari, A. (2015). “All we want are toilets inside our homes!” The critical role of sanitation in the lives of urban poor adolescent girls in Bengaluru, India. *Environment and Urbanization*, *27*(1), 73-88. [↑](#footnote-ref-19)
20. Das, P., Baker, K. K., Dutta, A., Swain, T., Sahoo, S., Das, B. S., ... & Mishra, P. R. (2015). Menstrual hygiene practices, WASH access and the risk of urogenital infection in women from Odisha, India. *PloS one*, *10*(6), e0130777. [↑](#footnote-ref-20)
21. Cooper-Vince, C. E., Kakuhikire, B., Vorechovska, D., McDonough, A. Q., Perkins, J., Venkataramani, A. S., ... & Tsai, A. C. (2017). Household water insecurity, missed schooling, and the mediating role of caregiver depression in rural Uganda. *Global Mental Health, 4*. [↑](#footnote-ref-21)
22. Daugirdas, J. T., Greene, T., Depner, T. A., Chumlea, C., Rocco, M. J., Chertow, G. M., & Hemodialysis (HEMO) Study Group. (2003).

Anthropometrically estimated total body water volumes are larger than modeled urea volume in chronic hemodialysis patients: Effects of age,

race, and gender. *Kidney international, 64*(3), 1108-1119. [↑](#footnote-ref-22)
23. Brooks, C. J., Gortmaker, S. L., Long, M. W., Cradock, A. L., & Kenney, E. L. (2017). Racial/ethnic and socioeconomic disparities in hydration status among US adults and the role of tap water and other beverage intake. *American journal of public health, 107*(9), 1387-1394. [↑](#footnote-ref-23)
24. MacDonald Gibson, J., DeFelice, N., Sebastian, D., & Leker, H. (2014). Racial disparities in access to community water supply service in Wake County, North Carolina. *Frontiers in Public Health Services and Systems Research*, *3*(3), 6. [↑](#footnote-ref-24)
25. Stillo, F., M.S.P.H., & Gibson, J. M., PhD. (2018). Racial disparities in access to municipal water supplies in the American south: Impacts on children's health. *International Public Health Journal, 10*(3), 309-323. [↑](#footnote-ref-25)
26. Bisung, E., & Elliott, S. J. (2016). ‘Everyone is exhausted and frustrated’: exploring psychosocial impacts of the lack of access to safe water and adequate sanitation in Usoma, Kenya. *Journal of Water, Sanitation and Hygiene for Development*, 6(2), 205-214. [↑](#footnote-ref-26)
27. Geller, A., Fagan, J., Tyler, T., & Link, B. G. (2014). Aggressive policing and the mental health of young urban men. *American journal of public health, 104*(12), 2321-2327. [↑](#footnote-ref-27)
28. Bosch, C., Hommann, K., Rubio, G., Sadoff, C., Travers, L., (2002). Water and Sani-tation. A Sourcebook for Poverty Reduction Strategies. The World Bank, Washing-ton, DC.ftp://ftp.solutionexchange-un.net.in/public/wes/cr/res29060702.pdf. [↑](#footnote-ref-28)
29. Shaffer, A., Suveg, C., Thomassin, K., & Bradbury, L. L. (2012). Emotion socialization in the context of family risks: Links to child emotion regulation. *Journal of Child and Family Studies*, *21*(6), 917-924. [↑](#footnote-ref-29)
30. Jocson, R. M. (2020). Filipino fathers’ parenting in the context of household and neighborhood risk: Familism as a protective factor. *Cultural*

*Diversity and Ethnic Minority Psychology, 26(*4), 472–482. [↑](#footnote-ref-30)
31. Zolnikov, T. R., & Blodgett Salafia, E. (2016). Improved relationships in eastern Kenya from water interventions and access to water. *Health Psychology, 35*(3), 273. [↑](#footnote-ref-31)
32. Oliver‐Smith, A. (2012). Debating environmental migration: society, nature and population displacement in climate change. *Journal of International Development*, *24*(8), 1058-1070. [↑](#footnote-ref-32)
33. Adams, M. C., & Kivlighan III, D. M. (2019). When home is gone: An application of the multicultural orientation framework to enhance clinical practice with refugees of forced migration. *Professional Psychology: Research and Practice*, *50*(3), 176. [↑](#footnote-ref-33)
34. Yamanis, T., Malik, M., Río-González, D., María, A., Wirtz, A. L., Cooney, E., ... & Poteat, T. (2018). Legal immigration status is associated with depressive symptoms among Latina transgender women in Washington, DC. *International journal of environmental research and public health*, *15*(6), 1246. [↑](#footnote-ref-34)
35. A Policy Statement by the Society for Community Research and Action: Division 27 of the American Psychological Association. (2018). Statement on the effects of deportation and forced separation on immigrants, their families, and communities. *American Journal of Community Psychology*, *62*(1-2), 3-12. [↑](#footnote-ref-35)
36. Hou, J., Yu, L., Fang, X., & Epstein, N. B. (2016). The intergenerational transmission of domestic violence: the role that gender plays in attribution and consequent intimate partner violence. *Journal of Family Studies*, *22*(2), 121-139. [↑](#footnote-ref-36)
37. Salvatore, P. P., Sula, E., Coyle, J. P., Caruso, E., Smith, A. R., Levine, R. S., ... & Dee, D. L. (2020). Recent increase in COVID-19 cases reported among adults aged 18–22 years—United States, May 31–September 5, 2020. *Morbidity and Mortality Weekly Report*, *69*(39), 1419. [↑](#footnote-ref-37)
38. Kinross, P., Suetens, C., Dias, J. G., Alexakis, L., Wijermans, A., Colzani, E., & Monnet, D. L. (2020). Rapidly increasing cumulative incidence of coronavirus disease (COVID-19) in the European Union/European Economic Area and the United Kingdom, 1 January to 15 March 2020. *Eurosurveillance*, *25*(11), 2000285. [↑](#footnote-ref-38)
39. National Academies of Sciences, Engineering, and Medicine. (2016). *Attribution of extreme weather events in the context of climate change*. National Academies Press. [↑](#footnote-ref-39)
40. World Health Organization. (2020). Coronavirus disease 2019 (COVID-19): situation report, 82. [↑](#footnote-ref-40)
41. David Miskus, NOAA, NWS, NCEP & CPC (2020) U.S Drought Monitor. August 15 Report. [↑](#footnote-ref-41)
42. Knutson, T., Camargo, S. J., Chan, J. C., Emanuel, K., Ho, C. H., Kossin, J., ... & Wu, L. (2019). Tropical cyclones and climate change assessment: Part I: Detection and attribution. *Bulletin of the American Meteorological Society*, *100*(10), 1987-2007. [↑](#footnote-ref-42)
43. Sadoff, C., & Smith, M. (2020). Water in the COVID-19 crisis: Response, recovery, and resilience. *IFPRI book chapters*, 115-117. [↑](#footnote-ref-43)